BOLTON

HOT WATER HEATER

SOLE MANUFACTURERS

DETROIT HEATING AND LIGHTING CO.

DETROIT, MICH.

NEW YORK
BOSTON
CHICAGO
ST. LOUIS

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DETROIT HEATING & LIGHTING CO.
1892

New Engelberg Abbey.

Conception P.O., Mo.

Febr. 24th. 1892.

Dear Sir: We are pleased to state as follows: Last fall, Baker & Smith Co. of Chicago, Ill. put into our church & monastery a Hot Water Heating Apparatus with two Bolton Heaters No. 25 double. The Heaters were furnished by the Detroit Heating & Lighting Co. Our church is 205 feet in length; 74 resp. 105 feet in width & 58 in hight. The monastery which joins the church consists of two wings: one 140 x 33 feet, the other 70 x 40feet, each 3 stories high with attic & basement. The buildings are standing on a hill & exposed from all sides. On weekdays, we heat the church always to 58-60 dgs.; on Sundays, to 65 dgs.; the monastery constantly to 65-70 dgs. The heat is very mild & nice, & uniform all over. The last radiator which is about 350 feet from the boiler is just as warm as the one closest to the boiler room. Our church-members are full of praise of the Apparatus. It is almost a miracle to them how a church of such dimensions can be heated to such perfection at any kind of weather. This winter, our Thermometer went as far as 30 below 0 on one or two occasions. The amount of fuel used is moderate. We burn soft coal (lump coal); on mild days, wood. Wood & coal together for warming both , church & monastery during this entire winter will not exceed 9 cars of coal.

Abbey New Engelberg.

per F. Placidus Sec.

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Classics
AT
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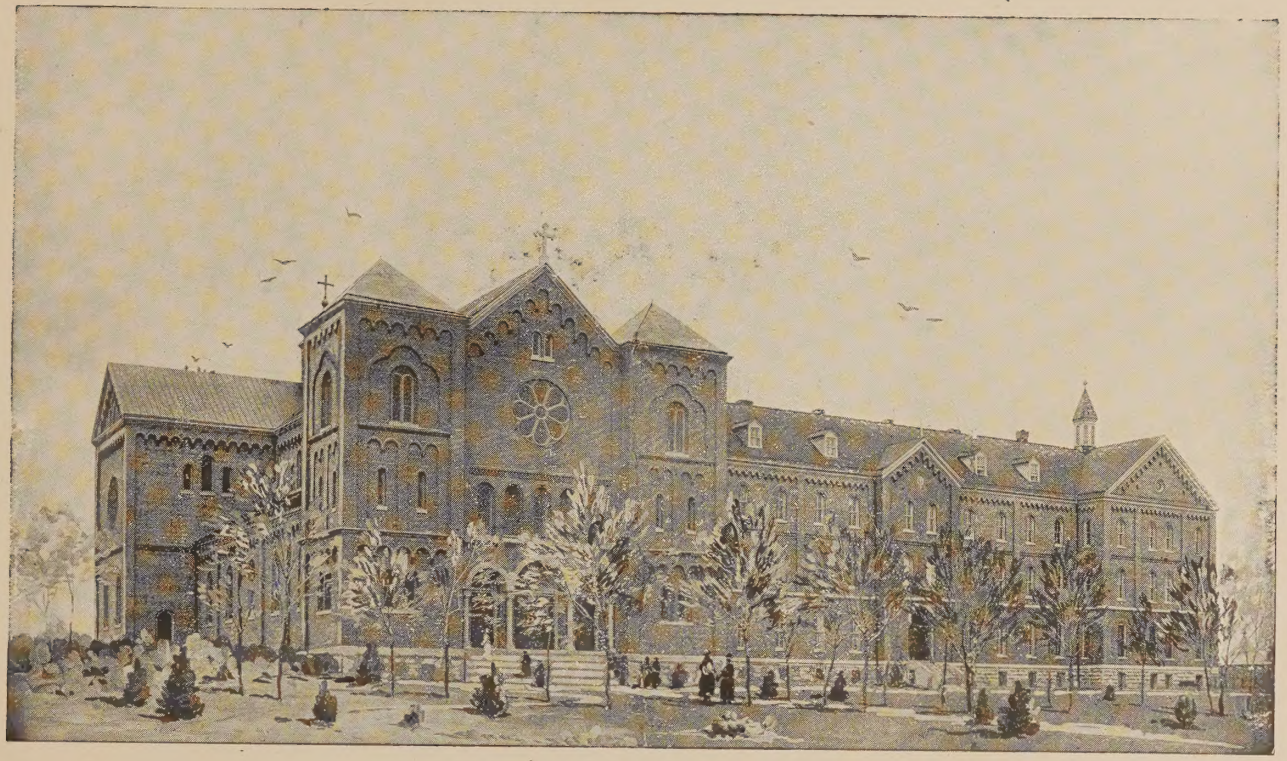
1892



NEW ENGELBERG ABBEY, CONCEPTION, MO.

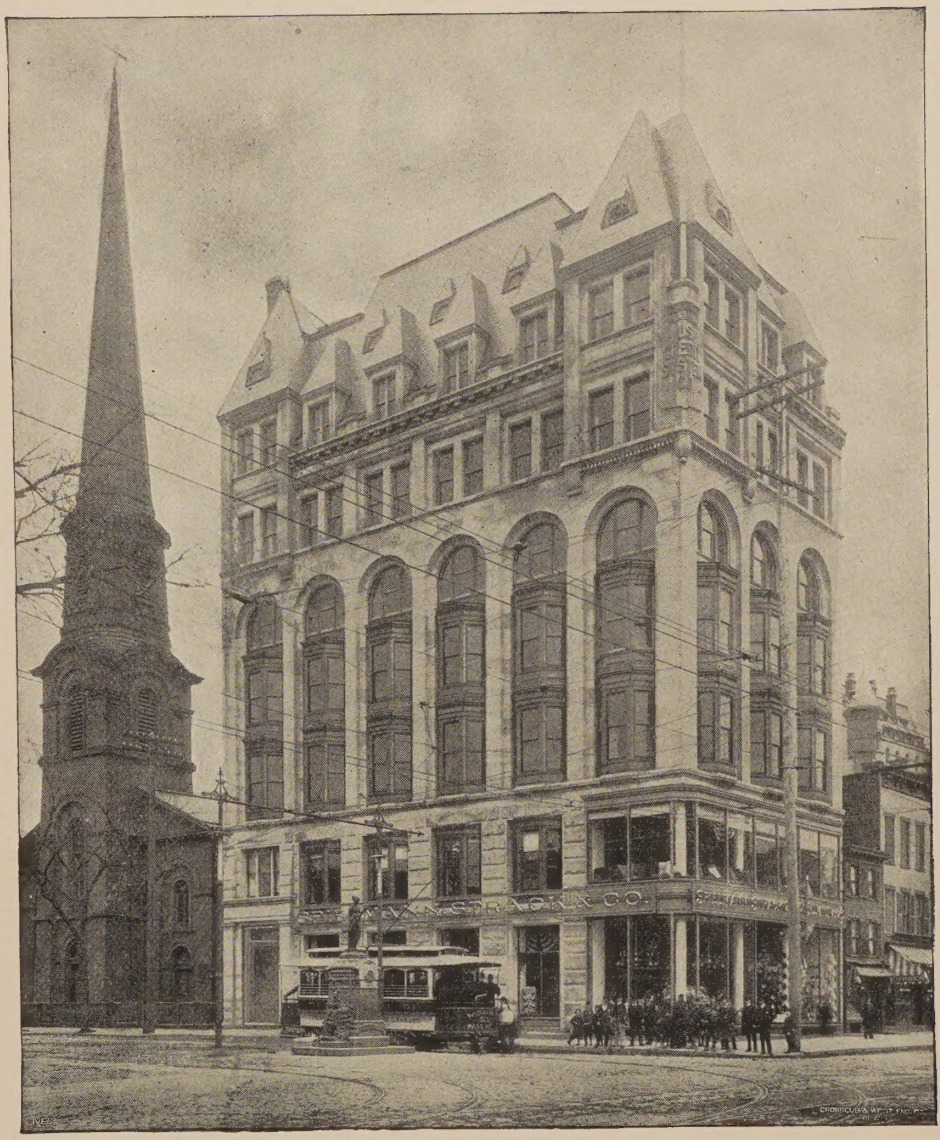
800,000 Cubic Feet of Air Space.

BROTHER ADRIAN, Architect.

8,500 Feet of Radiation.

HEATED BY BOLTON HEATERS.

A cut of the class of heaters used in this building is shown on page 30.



U. S. Credit System Company's Building. Newark, N. J.

GUSTIVE STACHLIN, Architect, N. J.

7,000 Feet of Radiation. **HEATED BY BOLTON HEATER.**

One of the Tallest Buildings in the Country heated by Hot Water.

A cut of the Class of Heater used in this building is shown on page 30.

THE CELEBRATED DETROIT

BOLTON HOT WATER HEATER

MDCCCXCII

THE ONLY STEEL PIPE HEATER.

FACTORY AND HOME OFFICE

DETROIT, MICH.

NEW YORK
126 LIBERTY STREET.

BOSTON
42 PEARL ST.

CHICAGO
88 LAKE STREET.

ST. LOUIS
414 N. BROADWAY.

SOLE MANUFACTURERS

Detroit Heating and Lighting Company

CITY OF CHICAGO
HEMPSTEAD WASHBURNE
MAYOR.

CHICAGO,
JUNE 12TH, 1891.

DETROIT HEATING
AND LIGHTING CO.,

GENTLEMEN:—THE BOLTON HOT WATER HEATER YOU PLACED IN MY RESIDENCE, 154 ASTOR PLACE, GIVES ENTIRE SATISFACTION.

I TAKE PLEASURE IN RECOMMENDING YOUR HEATER AND SYSTEM TO ALL IN NEED OF A FIRST-CLASS HOT WATER HEATING APPARATUS.

YOUR DOUBLE FIRE-POT ARRANGEMENT IS AN ADMIRABLE FUEL SAVING FEATURE.

THE HEATER IS EASILY MANAGED, REQUIRES BUT LITTLE ATTENTION, AND PRODUCES A MILD AND HEALTHFUL HEAT.

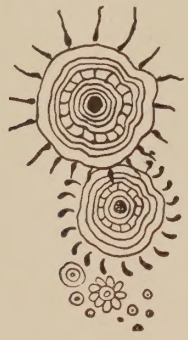
YOURS RESPECTFULLY,

HEMPSTEAD WASHBURNE

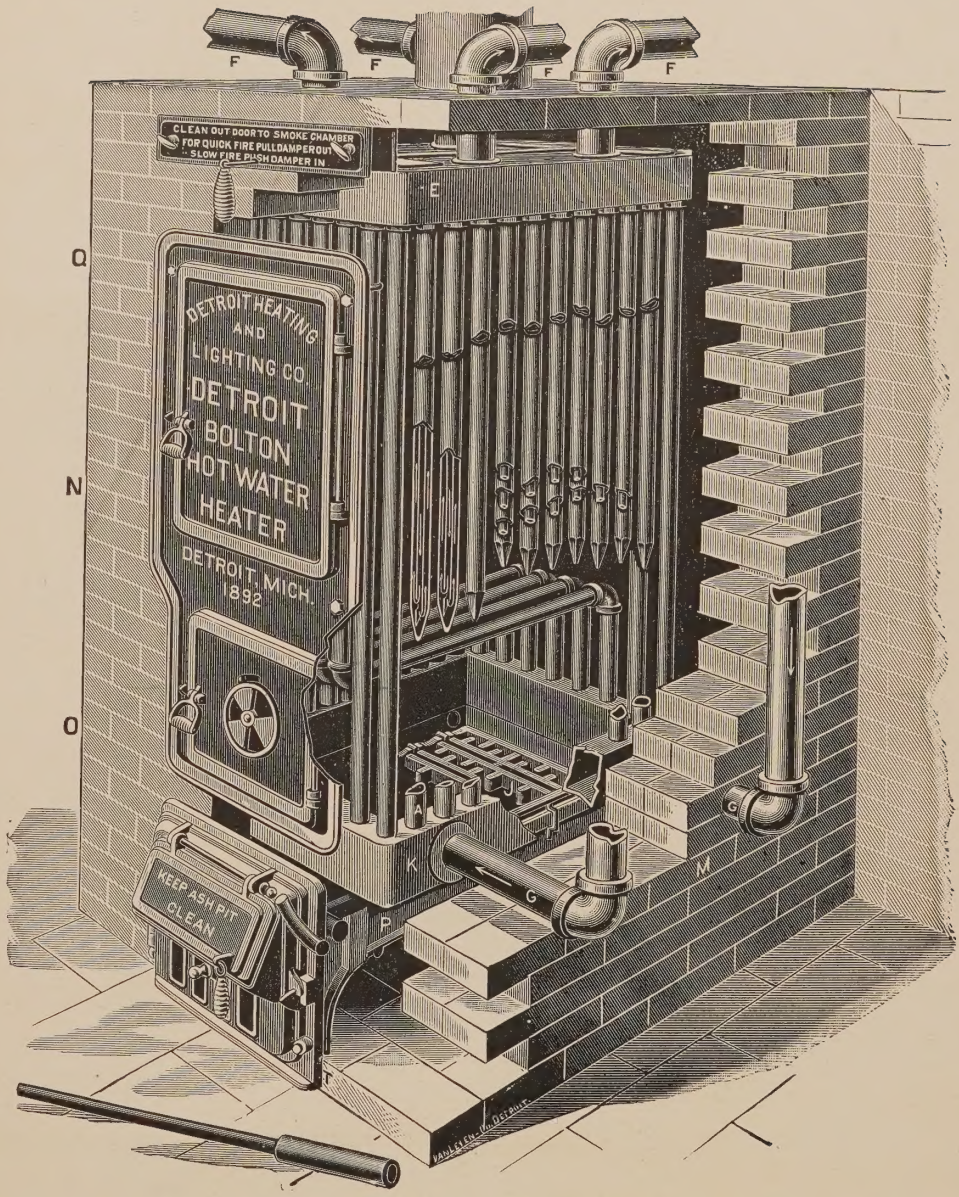
Residence of Hon. Hempstead Washburn, Mayor.

Julius A. Huber, Architect, Chicago.

One of The Results of the Increased Attention



WHICH has been given during the last few years to appliances for comfort and the sanitary appointments of dwellings and public buildings is the establishment of the supremacy of the hot water system of heating. Water has long been recognized as the best medium for conveying heat from a central source to the various rooms and portions of a building, but frequent failures in the past to construct an apparatus that would always produce satisfactory results gave rise to the idea that, while the theory was correct, it was impracticable, at least in cold climates. Of late years, however, great improvements have been made, and in this Heater the system may be said to be brought well-nigh to perfection.



BOLTON HEATER

(BROKEN OUT SHOWING CONSTRUCTION.)

PRINCIPLES OF HOT WATER CIRCULATION

HE circulation of water in a heating apparatus is accomplished without pump or pressure, by the simple force of gravitation.

As soon as the fire is started the heat it gives off is taken up by the nearest particles of water. These being expanded and made lighter by the heat, are at once displaced and forced upward by the heavier particles of cold water settling downward. The warm water rises to the top of the heater, and thence through the flow pipes to the various radiators, where it parts with its heat, which is given off into the rooms. As it grows cooler, and consequently more dense, it passes into the return pipes, which conduct it back to the bottom of the heater.

This process is continuous, and its rapidity is in direct proportion to the intensity of the heat in the furnace. The hot water in the flow pipes is always overbalanced and driven upward by the denser and heavier columns of cold water in the return pipes.

The water with which the apparatus is first filled is used over and over again, the only loss being the slight evaporation at the expansion tank.

AVERY LIBRARY
COLUMBIA UNIVERSITY

ST. LOUIS, MO., RESIDENCES HEATED BY BOLTON HEATERS.

Messrs. BARNETT & HAYNES, Architects.
THEO. LINK, ESQ., Architect.

E. JANSSEN, ESQ., Architect.
Messrs. JUNGENFELD & CO., Architects.

E. JANSSEN, ESQ., Architect.
Messrs. GRABLE & WEBER, Architects.

Advantages of the Hot Water System

HOT Water begins to radiate heat, in some degree, as soon as the fire is started, and continues to do so long after it is out—until the whole body of water is cold. No fuel is burned without the direct benefit of its product going to the radiators.

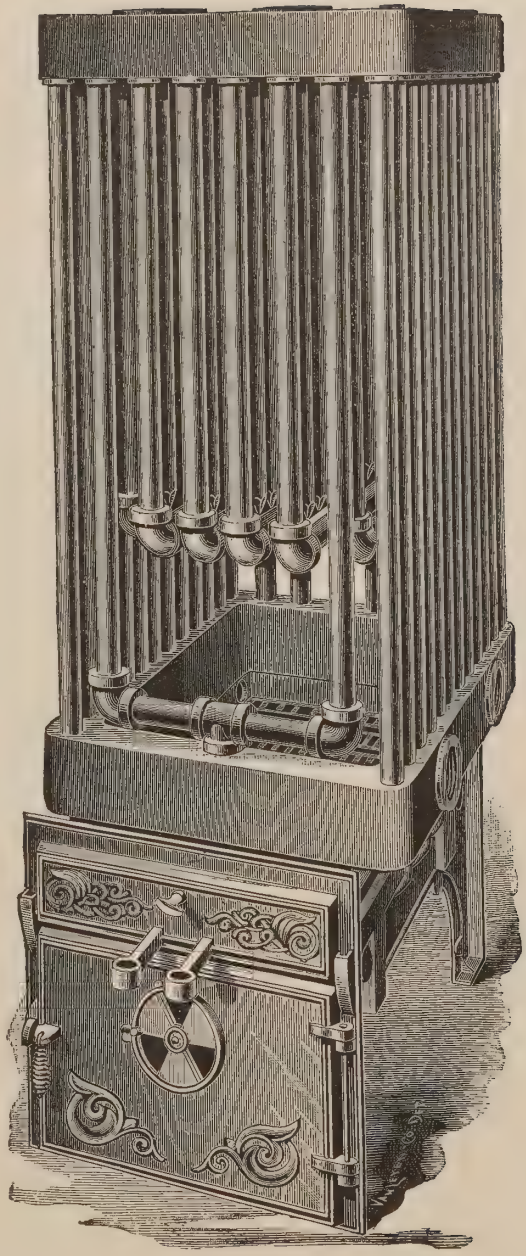
There are only few days in the year when the full capacity of the heater is required. At all other times the action of the Hot Water apparatus can be controlled at the furnace, running the fire very low and using correspondingly little fuel on a mild day.

Its superiority in this respect is marked in comparison with the hot air furnace, which is most extravagant in its consumption of fuel.

These conditions are also conducive to *greater comfort* than can be obtained from any other mode of heat. Whatever the weather, the temperature of the rooms can be regulated accordingly. The Hot Water Heater is equal to the demands of the severest winter, and can be made to slightly temper the chill of late spring and early fall.

The heat in a room can be regulated by partially closing the radiator valve, and checking the current of water; while a steam radiator, if not entirely shut off, becomes filled with steam and correspondingly hot.

The Hot Water Apparatus is entirely noiseless. It is not affected by the direction or force



SINGLE FIRE POT HEATER READY FOR BRICK CASING.

An extension of this principle produces the Double and Triple Fire Pots.

Ash Pit and Base are of our old 1888 pattern.

of the wind, and never fills the rooms with blasts of cold air or the disagreeable and poisonous gases from burning coal which arise from hot air registers. It is perfectly clean, while hot air furnaces discharge through the registers quantities of dust, from the cellar or from out of doors.

The Hot Water system is *absolutely safe.* Almost every week in winter one reads of *fires* caused by over-heated furnaces. The Hot Water pipes are never hotter than boiling water, and cannot ignite wood or any other inflammable material that may be near or against them.

The Hot Water apparatus being open to the atmosphere, through the expansion tank, there is no other pressure on the pipes than the weight of the water which they contain. There is therefore no explosive force and no resistance.

The Hot Water System is *most durable*, for obvious reasons. Its fire surfaces are always protected by water on the opposite side so that they cannot burn.

Its durability is further enhanced by its *simplicity.* It has no safety valve, steam gauge, water supply regulator, draft regulator, or any other delicate or complicated attachments.

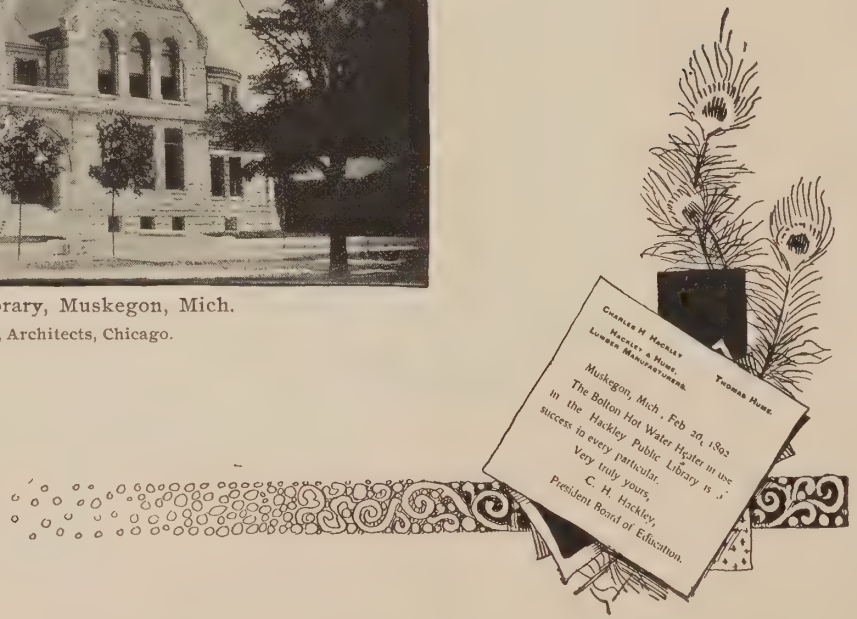
The most important consideration is *healthfulness.* The hot, dry atmosphere and sudden changes of temperature in rooms heated by furnaces have long been held responsible for many of our most common ailments, especially headaches and affections of the throat and lungs. With Hot Water heat the air is not burned and vitiated by contact with overheated surfaces. With an even, mild warmth it retains all its natural vitality.

These facts having been established by experience, as well as by the testimony of engineering and sanitary experts, it has come about that Hot Water heat is now included in the "modern improvements" of our best dwelling houses, and is in favor for warming greenhouses, churches schools, and other public and business buildings.

Hackley Public Library, Muskegon, Mich.

Patton & Fisher, Architects, Chicago.

6,000 Feet of Radiation.



Modern Heaters

CONSEQUENT upon the demand thus created for a Hot Water apparatus, various heaters, more or less satisfactory in their operation, have been devised and offered to the public.

Certain points of superiority have been attained in every case. All Hot Water heaters are clean and safe; most of them are economical, durable and easily managed.

The model heater should possess, in addition to these advantages, such directness of action and rapidity of circulation as to make it readily responsive to any desired change and equal to the requirements of any climate.

In constructing a heater it is therefore necessary, first, to provide direct and free passage for the water from bottom to top, with the least possible resistance. The faster the water passes over the fire surfaces, the more heat it will carry away. The next consideration is to bring the products of combustion in contact with heating surfaces of such extent that the greatest possible proportion of heat shall be taken up by the water.

Cast iron boilers, having large water spaces encased in thick masses of metal, are slow in transferring to the radiators the heat of the fire. They are also deficient in durability, as the metal is highly susceptible to fracture, and subject to sand holes, which are not always apparent until developed by service. They are mostly built in sections, and their flanged and bolted joints can hardly be made permanently secure against leaks.

Boilers have been constructed of light, tough, wrought iron pipes, which are proof against cracks and interpose a minimum of metal between the water and the heat of the fire. These pipes,

Residence of WM. H. WELLS, Esq.

W. H. MILLER, ARCHITECT, ITHACA, N. Y.

DETROIT BUILDINGS

Residence of J. S. KEEN, Esq.

DONALDSON & MEIER, ARCHITECTS, DETROIT.

DTTROIT, MICH., SEPT. 16, 1892.

I wish to express my gratification with the results obtained from the Bolton Hot Water Heater in the Woman's Hospital and Foundling's Home. Everything has worked in a very satisfactory manner, and has more than met my expectations.

HELEN E. CONKLING,
President.

DETROIT, May 29, 1892.

I am pleased to be able to speak in commendation of the Bolton Hot Water Heater in my residence. This last winter it has kept my house perfectly heated, and the winter before, during the work of construction of the house, seemed able to take care of all the cold air which came in through half stopped doors and windows. I am entirely satisfied with it, and can cordially recommend it to others.

Yours truly,
WM. H. WELLS,
885 Jefferson Ave.

DETROIT, July 29, 1892.

The Bolton Hot Water Heater in my house has been entirely satisfactory, having accomplished all that was claimed for it.

I find it economical, requiring very little attention, emitting no ash dust or gas, and giving out a quality of heat unsurpassed. How so small a fire pot and boiler heats such an amount of space is a marvel to me.

J. S. KEEN,
81 Forest Ave. West,
Sec'y Croul Bros.

DETROIT, August 4, 1892.

The Bolton Hot Water Heater in my residence continues to give excellent satisfaction, and the ones we use for heating our office and salesroom works to perfection.

I should certainly recommend it under all conditions, to persons requiring heaters.

GILBERT W. LEE,
John R St. and Ferry Ave.
of Lee, Cady & Co

WOMAN'S HOSPITAL AND FOUNDLINGS' HOME.

G. W. LLOYD, ARCHITECT, DETROIT

HEATED BY

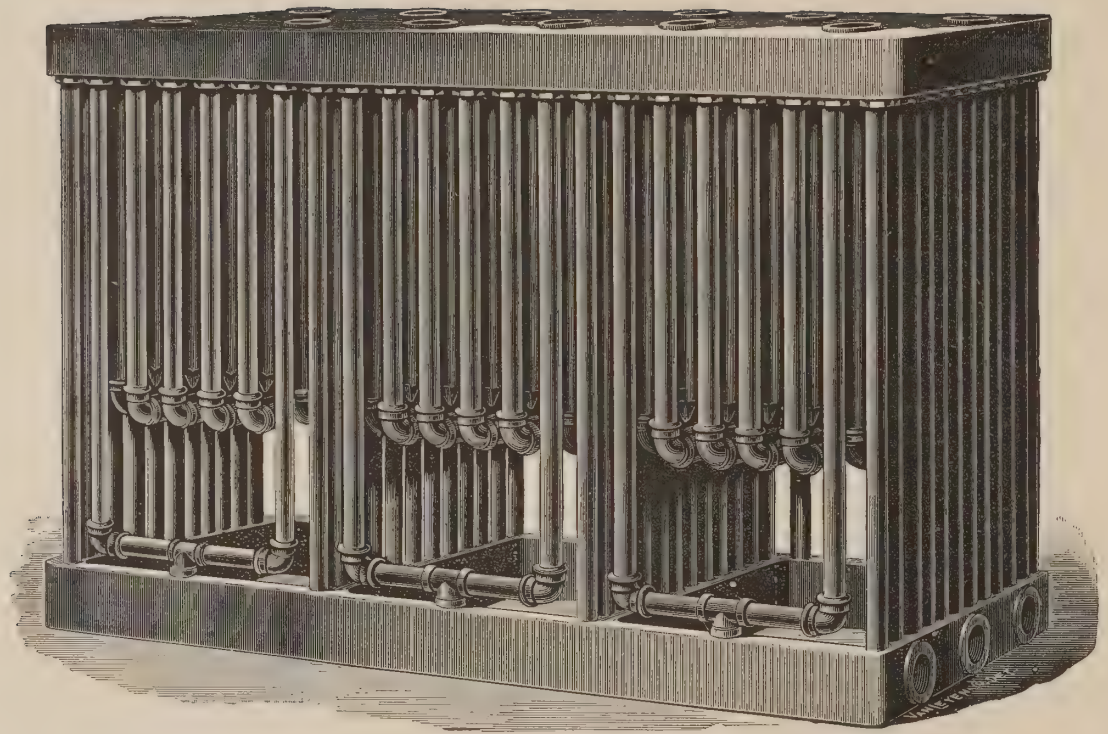
DETROIT BOLTON HOT WATER HEATERS.

Residence of G. W. LEE, Esq.

MASON & RICE, ARCHITECTS, DETROIT

Mrs. Theo. Irving's St. John's School (of New York),
THE "CASTLE" TARRYTOWN-ON-HUDSON.

HEATED BY DETROIT HEATING & LIGHTING CO'S BOLTON HEATERS.



FRONT VIEW—TRIPLE FIRE POT.

WITHOUT ASH PIT AND GRATE.

Double Fire Pot Heaters made on same fuel saving principle. Especially advantageous in mild, winter weather, when not necessary to use more than one or two of the Fire Pots. No other make of Heater has this advantage. See pages 26 and 27.

however, are nearly all horizontal, and the friction thus created is increased by numerous sharp bends. The circulation is thereby so retarded as to seriously affect the operation of the heater.

An examination of the accompanying cuts will show how these defects have been avoided in

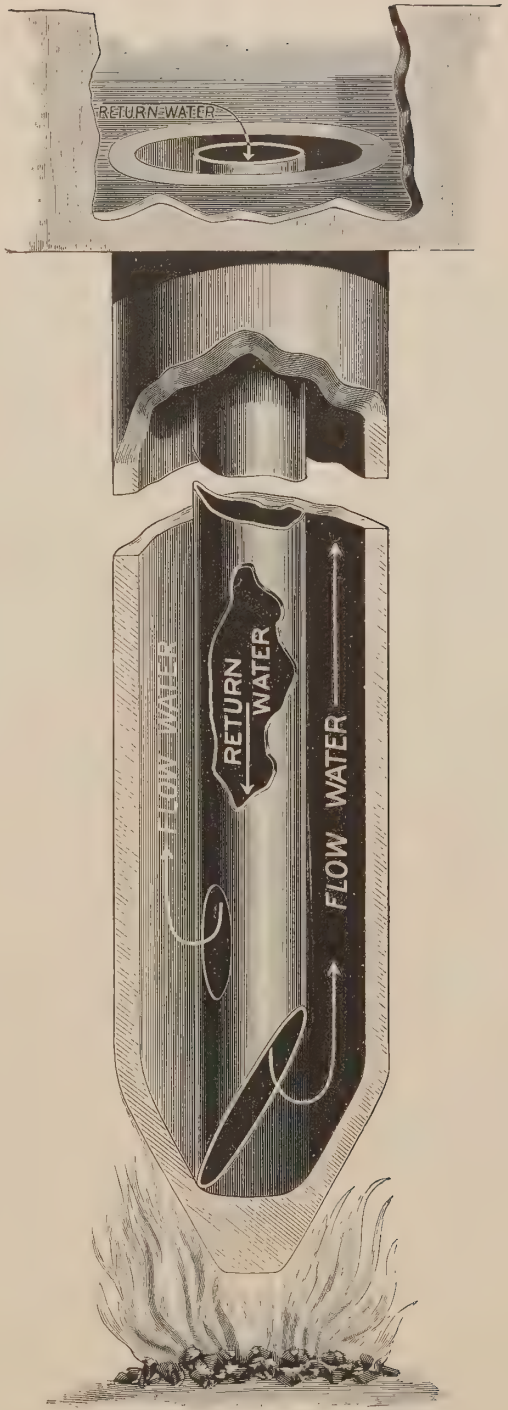
THE BOLTON HEATER

MANUFACTURED ONLY BY THE DETROIT HEATING AND LIGHTING CO.

Two cast iron water chambers, forming respectively the base and top of the boiler, are connected by steel pipes screwed into the base and connected with the top casting by a running thread and lock-nut. The upper chamber is pierced with flue holes for the escape of smoke and gases; the lower one surrounds the grate. All the pipes are vertical, excepting one row, which passes almost horizontally from back to front, forming the top of the fire-pot. Above these horizontal pipes is the arrangement of vertical pendent pipes, or drop tubes, which is one of the most noticeable features of our Bolton Heater. The advantages of this construction are readily apparent.

HEATING SURFACE

THE top, sides and back of the fire-pot are composed of thin steel pipes, through which there is a constant current of water. No fire-brick or other non-conducting substance intervenes to absorb the heat or produce clinkers. The products of combustion pass up amongst the drop tubes which occupy the upper part of the heater, before escaping through the flue holes. Every available particle of heat is thus taken up by the water and transferred to the radiators.



DROP TUBE—(EXACT SIZE.)

Split Longitudinally showing Interior Circulating Tube. See Description Opposite Page, also Page 44.

THE PENDENT PIPES PERFORM AN IMPORTANT PART in this work. Inside each one is a circulating tube, extending from top to bottom and open at both ends. The heat from the fire, acting on the larger pipes, is taken up by the Flow water between the circulating tube and the outer pipe. By reason of its increased temperature and lessened density, this Flow water is driven upwards by a descending current of cooler Return water in the inner tube. Each pendent pipe, with its inner circulating tube, thus becomes a valuable auxiliary circulator, taking the already warm water from the top of the boiler down to the lower extremity of the pipe, just above the fire, and returning it many degrees hotter.

The value of this arrangement will be appreciated when it is understood that the circulation in these pendent pipes is far more vigorous and rapid than in any other part of the heater, or than can be obtained by any other known device. (See cut on opposite page.)

The extent of this heater's fire surface is beyond comparison with that of any other in proportion to grate surface, and to the quantity of water contained in the boiler. Moreover, its heating surface is all effective. No part of it is cut off by intervening sections, but all is uniformly exposed to the direct heat of the fire. It is well known that the spent heat from products of combustion which have passed through circuitous passages is of little value, compared with active, direct rays of heat. When this is considered in connection with the exceptionally free and rapid circulation of our heater, it is easy to understand the causes of its extraordinary capacity.

The flue-holes in the top may be opened wide in order to start the fire or induce unusual draft. At other times they are nearly closed by a damper, which leaves only sufficient openings to insure adequate draft and permit the escape of smoke and gases. By this means the heat is mostly retained within the heater, as in an oven. It is therefore taken away by the water, and does not

See Testimonials, Page 48.

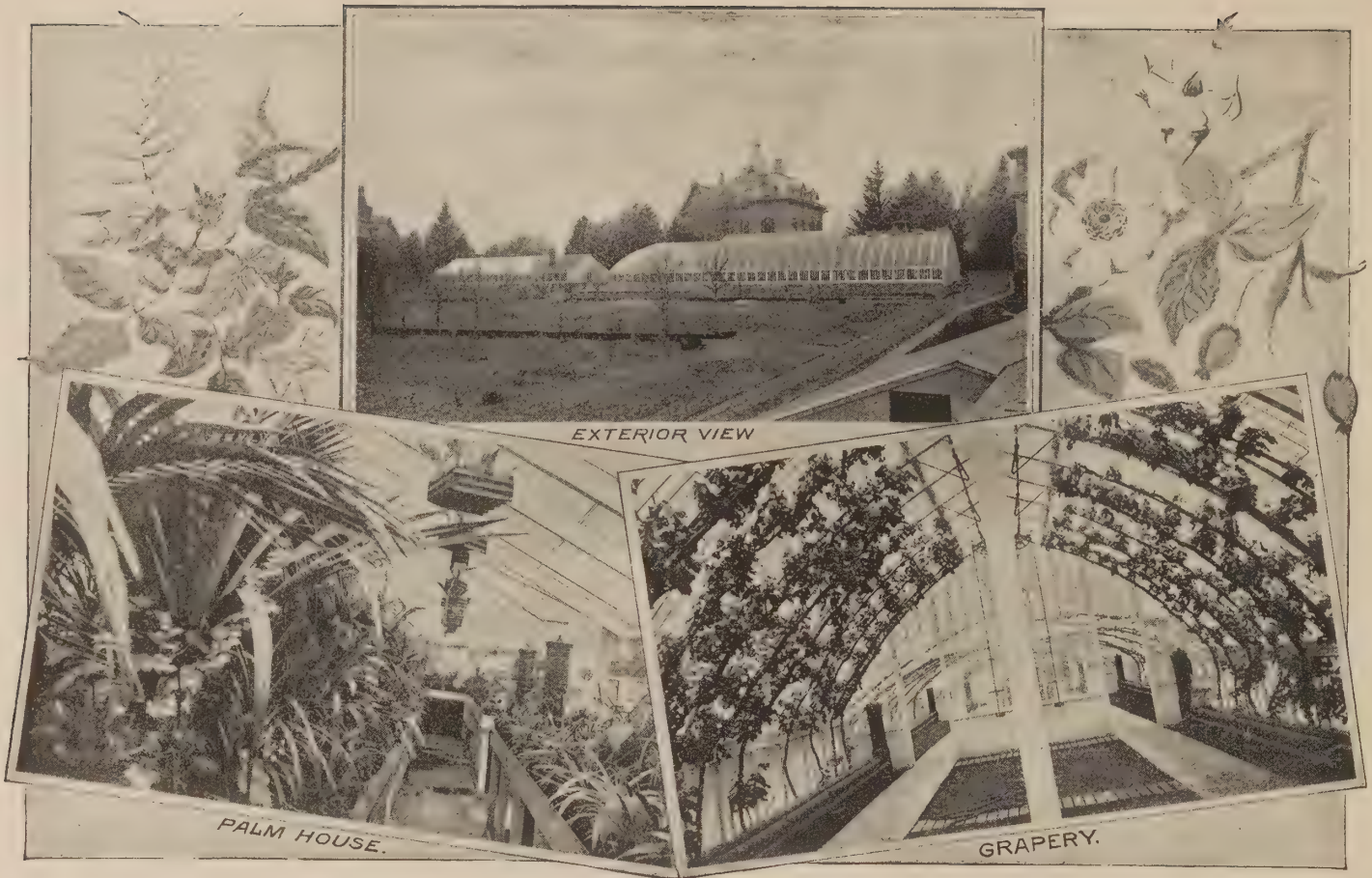
escape through the smoke pipe. People are often deceived by the assertions of manufacturers that the true theory of construction for a hot water heater is to cover the fire with successive flat surfaces, thus sacrificing the rapid circulation, which is the first essential of an efficient heater, and greatly reducing the actual fire surface by cutting off the upper portions from the direct heat of the fire. The lowermost sections, thus having to do all the work of the boiler, give out far more quickly than if the work were equally distributed over the entire heating surface, as in our Bolton.

CIRCULATION

THE weakness in most heaters is in their imperfect circulation. Where the water is contained in large sections, with unequally heated surfaces, the currents of convection create eddies which retard the flow of the water. In horizontal pipes and sections the resistance of friction has to be overcome. In our Bolton Heater the water passes through small pipes, where there are no counter-currents, and the direction of almost every pipe in the boiler is vertical, so that the rapid upward flow of the water is unimpeded. The result is the most perfect possible circulation.

SIMPLICITY

NOTHING could be simpler than our Bolton Heater. Every part of its heating surface is readily accessible by doors provided for that purpose, and can be brushed and scraped whenever necessary. The fire rests on a rocking grate of the most improved design, easily kept clean and free from ashes and clinkers. Any person capable of managing an ordinary coal stove can get satisfactory results from this heater. So simple is its construction that every pipe of its fire



EXTERIOR AND INTERIOR VIEWS OF MRS. O. F. WINCHESTER'S GREENHOUSES, NEW HAVEN, CONN., HEATED BY DETROIT BOLTON HOT WATER HEATER.

423 Prospect Street, NEW HAVEN, Conn.
March 28th, 1892.

DETROIT HEATING & LIGHTING CO.,

Gentlemen:—The No. 10 Detroit Bolton Hot Water Heater put into Mrs. O. F. Winchester's greenhouses is quite satisfactory. It keeps the greenhouses at the proper temperature in all kinds of weather, and is easily worked. I can recommend it to anyone wanting a good boiler.

Yours respectfully, ROBERT PATON, Gardner.

surface can be taken out and replaced, without disturbing the brick work. The cast iron front may be removed for this purpose, but the work could, in most cases, be done through the large flue-cleaning door. No other heater requires so few repairs, and in no other can they be so easily made.

ADAPTABILITY

Our Bolton Heater is adapted to all classes of buildings, from the largest to the smallest, and to all ranges of climate.

We are heating some of the largest public buildings—Schools, Hospitals, Court-houses, etc.—successfully and economically.

In *Greenhouses* particularly, where the successful growth of the plants depends upon an even warmth, uniformity of temperature is of special importance, and this can be obtained only by use of the Hot Water System. This class of work forms a special branch of our business and receives particular attention.

Our Bolton Heater is adapted to all ranges of climate. It is the favorite in the extremely cold localities of Manitoba, Ontario and Quebec; in the windy regions of our own Northwest; and in the mild climates of the Gulf States.

DURABILITY

THE boiler is practically all one piece, its parts being screwed together, and it has no bolted or flanged joints to leak. There is not a bolt in the entire Heater. The material is almost entirely steel, which is not liable to rust or fracture.

KISER OFFICE BUILDING, ATLANTA, GA.

Bruce & Morgan, Architects.

Containing 9,000 Feet of Radiation. **HEATED BY BOLTON HEATERS.**

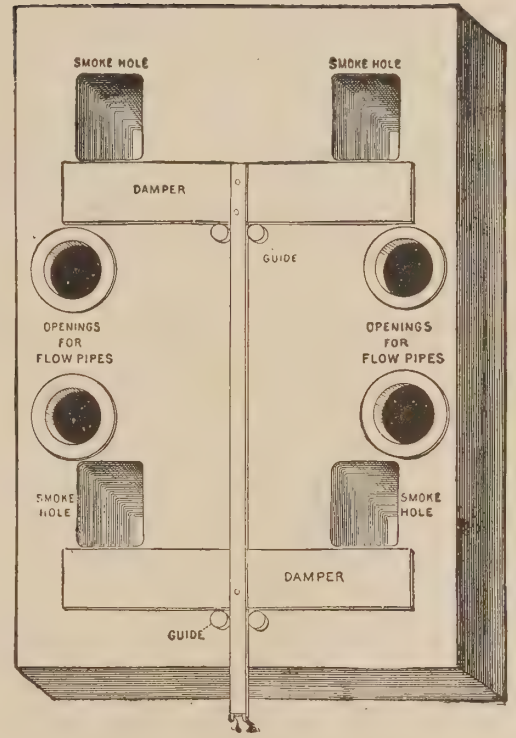
A cut of this class Heater is shown on Page 30

This Building, excepting the ground floor, is occupied by the General Offices of the Richmond & Danville R. R. Co.

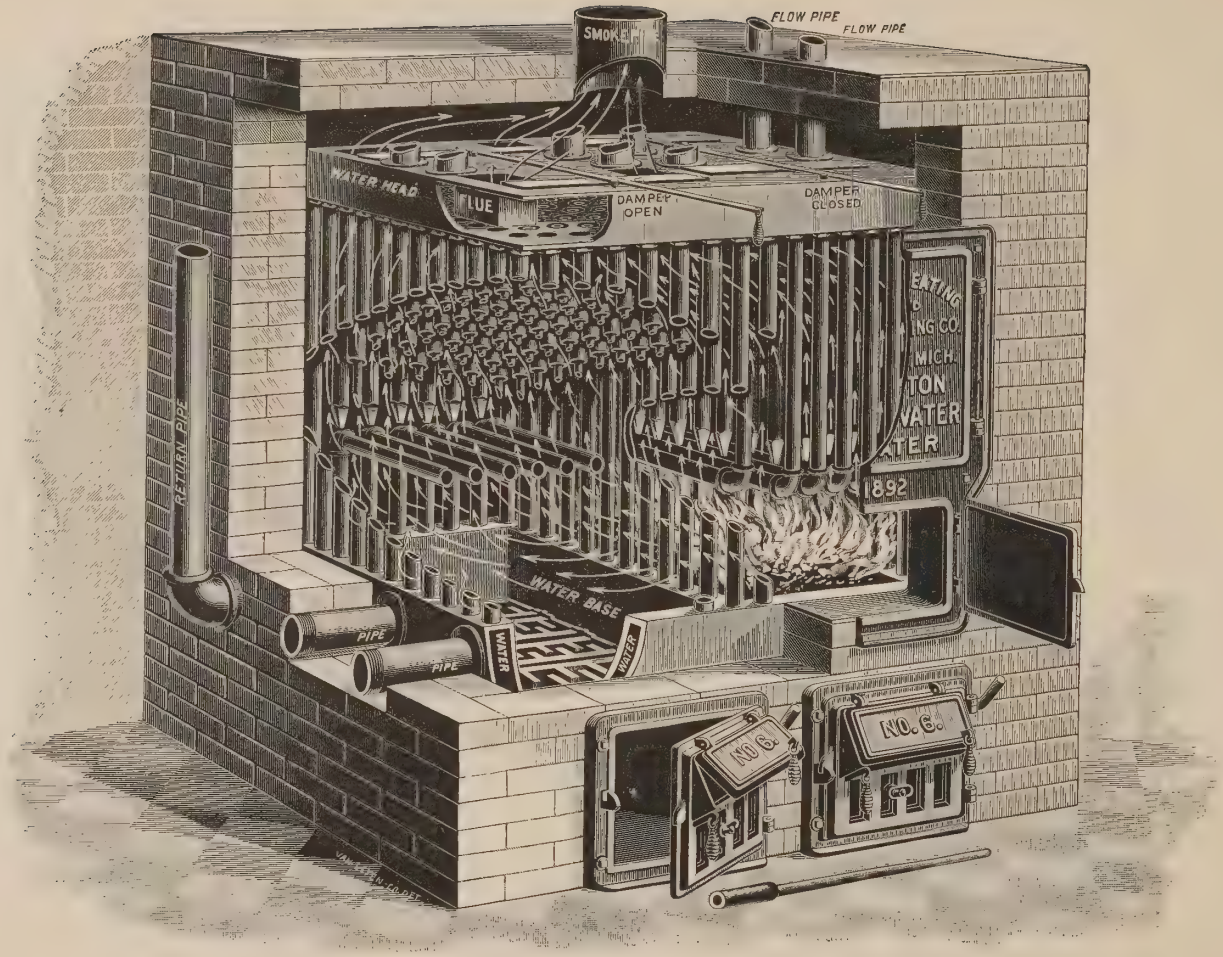
A tubular boiler was lately taken out of a house in Montreal, where it had been in use twenty years, and had to be replaced in consequence of the enlargement of the house. The boiler was taken apart and its pipes found as clean as new, without rust or scale.

Of one of our Bolton Heaters, which has been in use in Arnprior, Ontario, for eleven years, its owner says that during that time it has never been out of order, nor has it cost a dollar in money or an hour of time for repairs; and it is to-day apparently as good as new.

The pendent Pipes, aside from their value as heating surface are an element in the exceptional durability of the Boiler. As an indication of the durability of these we may mention the experience of the Silsby Manufacturing Company, who find that the pendent pipes in their steam fire engines last, on an average, fifteen years, When it is remembered that the service and wear to which our pendent pipes are subjected, in hot water heating, is many times less, the strength and permanence of our Bolton Hot Water Heater is easily understood.



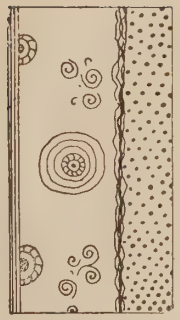
TOP OF BOLTON HEATER.



THE GREAT FUEL SAVER—DOUBLE FIRE POT BOLTON HEATER.

See Description Opposite Page,

ECONOMY OF FUEL



FOR ordinary winter weather when a heater's full capacity is unnecessary to maintain comfortable temperature, our *double and triple fire pot heaters* are great fuel savers. A great saving in coal is accomplished by using only one-half or one-third of their fire-pot capacity, while the remaining unused fire boxes are *kept in reserve* for the extreme weather commonly experienced but for a few days in any winter.

From an inspection of the accompanying cut it will be seen there is no cast iron or brick wall partition between the heater's sections as is the case in the "Twinned" boilers of other makes. This construction is peculiar to the Bolton Heater, and gives it the great advantage of passing the heat of only one fire box over the entire heating surface of practically two or three heaters, producing ample heat and resulting in a great saving of coal. This operation would be impossible were the heaters built with partitions between sections or entirely separate, necessitating full fire box capacity to be always in use, even on the mildest winter day.

With only one fire box in use, by closing the direct draft damper above the fire and leaving open the one belonging to the unused fire box, the heat in order to escape must first pass over and among the pipes composing the heating surface of both parts of the boiler. (As indicated by arrows in cut.)

As the water base and top for both fire pots are continuous, a fire in either side of the heater acts directly upon the entire body of water and not alone upon that in its individual section, as is the case with "twinned" heaters.

These are among the many valuable features of our Bolton Hot Water Heater that have made it the especial favorite with Architects and Experts for large work as well as for ordinary Home and Greenhouse heating.

A RECORD.

1890—Jan. 17th.

The heating of my big 27 room house from top to bottom with your Bolton Hot Water Heater is something about which I am both pleased and surprised.

GEO. L. MILLER.

1891—Feb. 11th.

The Bolton Hot Water Heater through a trying season of below zero mercury and searching wind and snowstorms, continues to be the joy of the house of Miller.

GEO. L. MILLER.

1892—Feb. 29th.

The Bolton Hot Water Heater continues to be a great success at my house. Three winters have tested the system to our entire satisfaction.

GEO. L. MILLER.

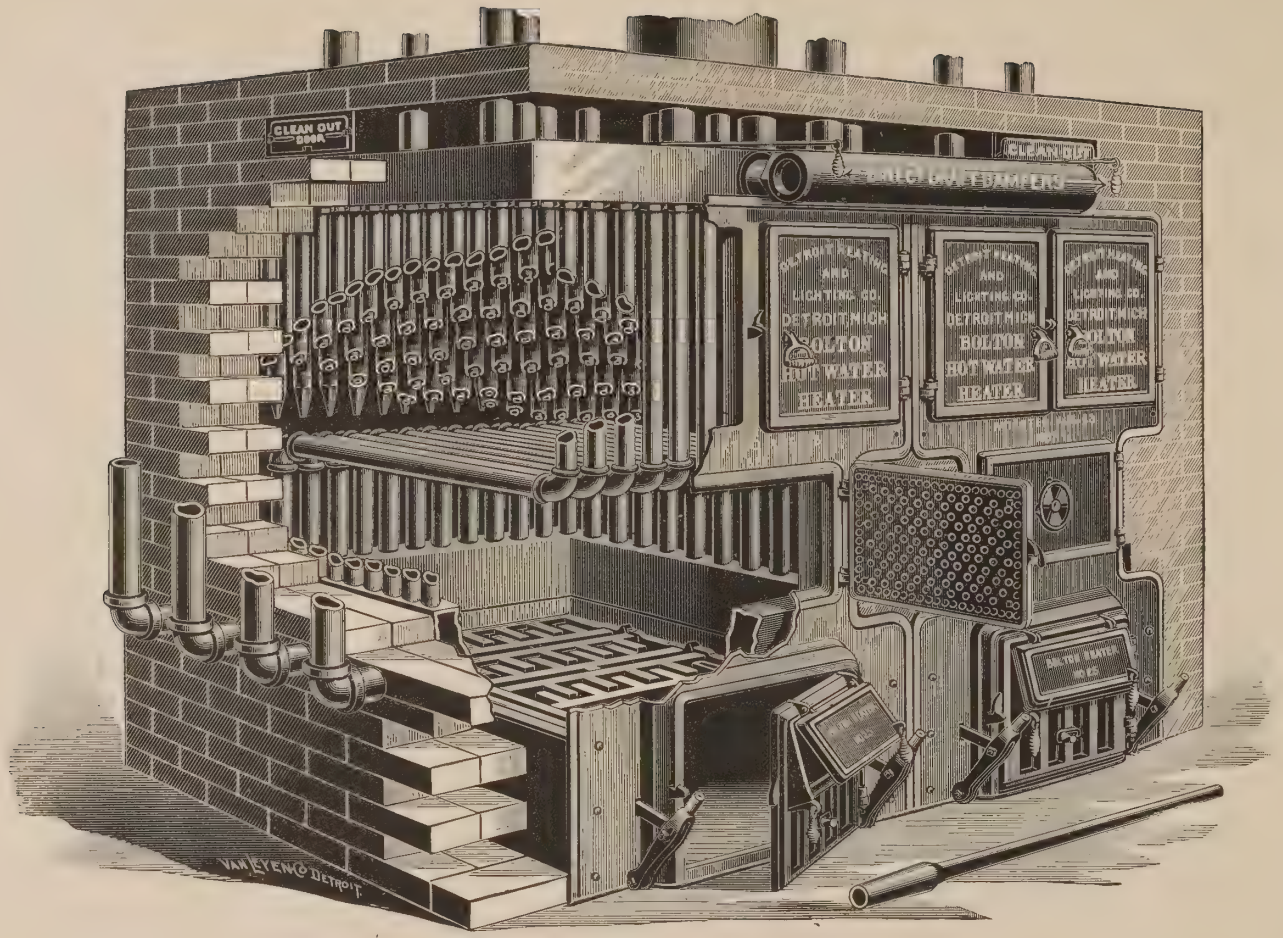
Residence of Dr. Geo. L. Miller, Seymour Park, Omaha, Neb.

Mendellsohn, Fisher & Lawrie, Architects, Omaha.

HISTORY

THIS Heater has been in use several years in the severe climate of Canada. The remarkable success of its work there suggested the advisability of introducing it into the United States, which was accordingly done in 1887. During the winter of 1887–8 it made such a good showing that it found a place in a large proportion of the better class of houses built in Detroit during the following season, besides replacing other and less satisfactory apparatus in many other buildings. Its record in this country is a repetition of its Canadian successes, and it has promptly taken a leading position. There are now thousands of these heaters in successful operation all over the country. We give herewith as references, names selected from our books, showing users in all parts of the United States,

from Massachusetts Bay
to the
and from Golden Gate,
Lake Superior to the
Gulf of of Mexico.



BOLTON HEATER FOR THE LARGEST BUILDINGS.

Sizes made to carry 2500 to 10000 feet of Radiation and upwards

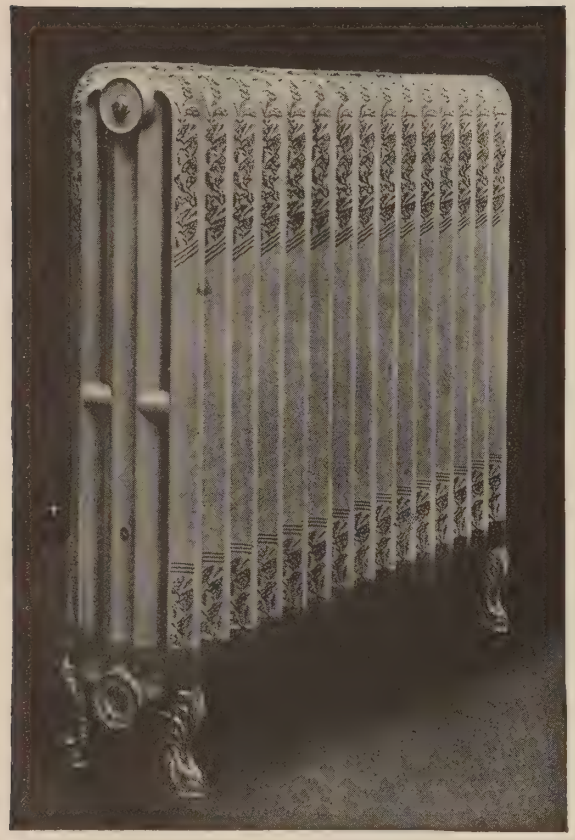
We give a list of a few of the large buildings it heats on page 44.

This is the style of heater used in the Convent of the Visitation, St. Louis, Mo., the largest hot water heated building in the country (excepting government buildings). See page 45.

Special Bolton Heaters for Extra Large Work

HOT Water Heating has come into special prominence of late for heating large public buildings, such as hospitals, schools, churches and business buildings, where sanitary and other conditions demand a uniform temperature. We have had contracts for buildings whose cubical contents range from 200000 to 1000000 cubic feet, and in view of the special requirements in this direction have produced our No. 20 series of Bolton Heaters, an example of which (the No. 25) is shown on opposite page. The No. 20 is a single fire-pot. No. 25 is two No. 20's combined so as to make a double fire-pot boiler, and the No. 30 is three No. 20's similarly united.

An advantage of this construction over the ordinary "twinned" cast iron boilers is, that when only one fire-pot is in use the heat may be made to pass over all the heating surface of the combined boilers, by closing the Direct Draft Damper (see small drop handles indicated by arrow heads in cut) belonging to the fire box that is in use, leaving open the damper above the unused fire box. In order to find an outlet, the heat must therefore pass among the pipes and over the heating surfaces of the entire boiler.



STANDARD HOT WATER RADIATOR

SPECIAL FEATURES.

Large Radiating Surface in proportion to Quantity of Water. Every Radiator absolutely Tight and Perfect. Circulation rapid. Easily and quickly taken apart and put together. Occupies smallest space.

DIMENSIONS, CAPACITY AND PRICE.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

SEPT. 1ST, 1892.
SUPERSEDES ALL PREVIOUS LISTS.

No. of Loops	FEET OF HEATING SURFACE.					PRICE—PLAIN.				
	43½ In.	37½ In.	31½ In.	25½ In.	21½ In.	43½ In.	37½ In.	31½ In.	25½ In.	21½ In.
3	17¼ ft.	15 ft.	12¾ ft.	10½ ft.	8¼ ft.	$ 8 63	$ 7 50	$ 7 14	$ 6 72	$ 5 94
4	23	20	17	14	11	11 50	10 00	9 52	8 96	7 92
5	28¾	25	21¼	17½	13¾	13 38	12 50	11 90	11 20	9 90
6	34½	30	25½	21	16½	17 25	15 00	14 28	13 44	11 88
7	40¼	35	29¾	24½	19¼	20 13	17 50	16 66	15 68	13 86
8	46	40	34	28	22	23 00	20 00	19 04	17 92	15 84
9	51¾	45	38¼	31½	24¾	25 88	22 50	21 42	20 16	17 82
10	57½	50	42½	35	27½	28 75	25 00	23 80	22 40	19 80
11	63¼	55	46¾	38½	30¼	31 63	27 50	26 18	24 64	21 78
12	69	60	51	42	33	34 50	30 00	28 56	26 88	23 76
13	74¾	65	55¼	45½	35¾	37 38	32 50	30 94	29 12	25 74
14	80½	70	59½	49	38½	40 25	35 00	33 32	31 36	27 72
15	86¼	75	63¾	52½	41¼	43 13	37 50	35 70	33 60	29 70
16	92	80	68	56	44	46 00	40 00	38 08	35 84	31 68
17	97¾	85	72¼	59½	46¾	48 88	42 50	40 46	38 08	33 66
18	103½	90	76½	63	49½	51 75	45 00	42 84	40 32	35 64
19	109¼	95	80¾	66½	52¼	54 63	47 50	45 22	42 56	37 62
20	115	100	85	70	55	57 50	50 00	47 60	44 80	39 60
21	120¾	105	89¼	73½	57¾	60 38	52 50	49 98	47 04	41 58
22	126½	110	93½	77	60½	63 25	55 00	52 36	49 28	43 56
23	132¼	115	97¾	80½	63¼	66 13	57 50	54 74	51 52	45 54
24	138	120	102	84	66	69 00	60 00	57 12	53 76	47 52
25	143¾	125	106¼	87½	68¾	71 88	62 50	59 50	56 00	49 50
26	149½	130	110½	91	71½	74 75	65 00	61 88	58 24	51 48
27	155¼	135	114¾	94½	74¼	77 63	67 50	64 26	60 48	53 46
28	161	140	119	98	77	80 50	70 00	66 64	62 76	55 44
29	166¾	145	123¼	101½	79¾	83 38	72 50	69 02	64 96	57 42
30	172½	150	127½	105	82½	86 25	75 00	71 40	67 20	59 40

SPECIAL DISCOUNTS.

Width of each Radiator, 10 inches. Length may be estimated by allowing 2½ inches for each section.

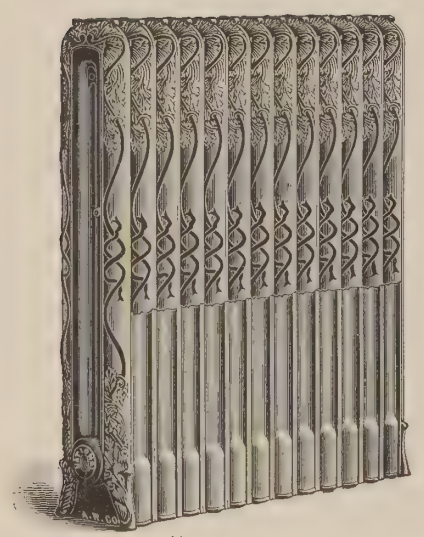
Radiation

THERE are three ways of heating by hot water circulation, viz.: Direct, Indirect and Direct-indirect radiation. For Direct radiation, coils or radiators are placed in the rooms to be heated, and the heat of the water as it comes from the boiler is given off directly into the rooms.

Indirect radiation is effected by placing radiators or coils in the basement, enclosed in tin-lined wooden boxes. Air from out of doors is passed over these radiators, and through air-ducts to registers opening into the rooms.

Direct-indirect radiators are located in the rooms, and air from out of doors is introduced so as to pass over their surfaces and become warmed before it is diffused through the rooms.

The most effective, and probably the most healthful of these methods is the direct. While indirect radiation is somewhat in favor for ventilating purposes, leading authorities are emphatic in asserting that it should be used only as an auxiliary, and that without direct radiation there can be no perfectly healthful and beneficial heat. This is also the most economical method, both in first cost of the apparatus and consumption of fuel.



National.
Direct-Indirect.

Bundy Elite.
Direct.

Radiators.

ANSWERS TO FREQUENT QUESTIONS

THE Bolton requires attention, in severe weather, two or three times a day. In mild weather once a day is sufficient.

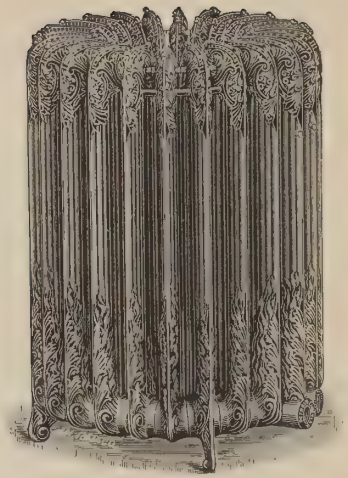
There are no dead corners in our heater's fire pot, although it has a square grate. The smoke flues are placed at the four corners, thus securing perfect combustion all over the surface of the grate.

We also make a "portable" heater, but we have a high opinion of the value of the brick casing, which prevents radiation of heat in the cellar, where it is not wanted, thereby increasing the efficiency of the radiators and economizing fuel.

There is never any difficulty in getting a sufficient quantity of pure air into a dwelling house which is not over-crowded with inmates. It is only necessary to provide an outlet for the vitiated air.

There is no probability of a hot water heating apparatus freezing up and causing trouble by leaks. In order for the pipes in a house to freeze it is necessary that the fire should be allowed to go out and remain out for a long time, in exceedingly cold weather. This is not at all likely to occur in an inhabited building. Even if the fire should go entirely out (which it would hardly be allowed to do in cold weather) the water in the pipes would retain a considerable degree of warmth for many hours. We take precautions against the absolute shutting off of the circulation in the radiator of an isolated room. If the building is to be vacated, it is easy to draw off the water from

PERFECTION.
CORNER.



DETROIT.
COLUMN OR CIRCULAR.

RADIATORS.

the entire system, with the exception of the pendent pipes, which may be emptied by evaporating the water with a very light wood fire.

There is no likelihood of annoyance from leaks. The pressure is so slight and the expansion and contraction so moderate, there is nothing to disturb the joints.

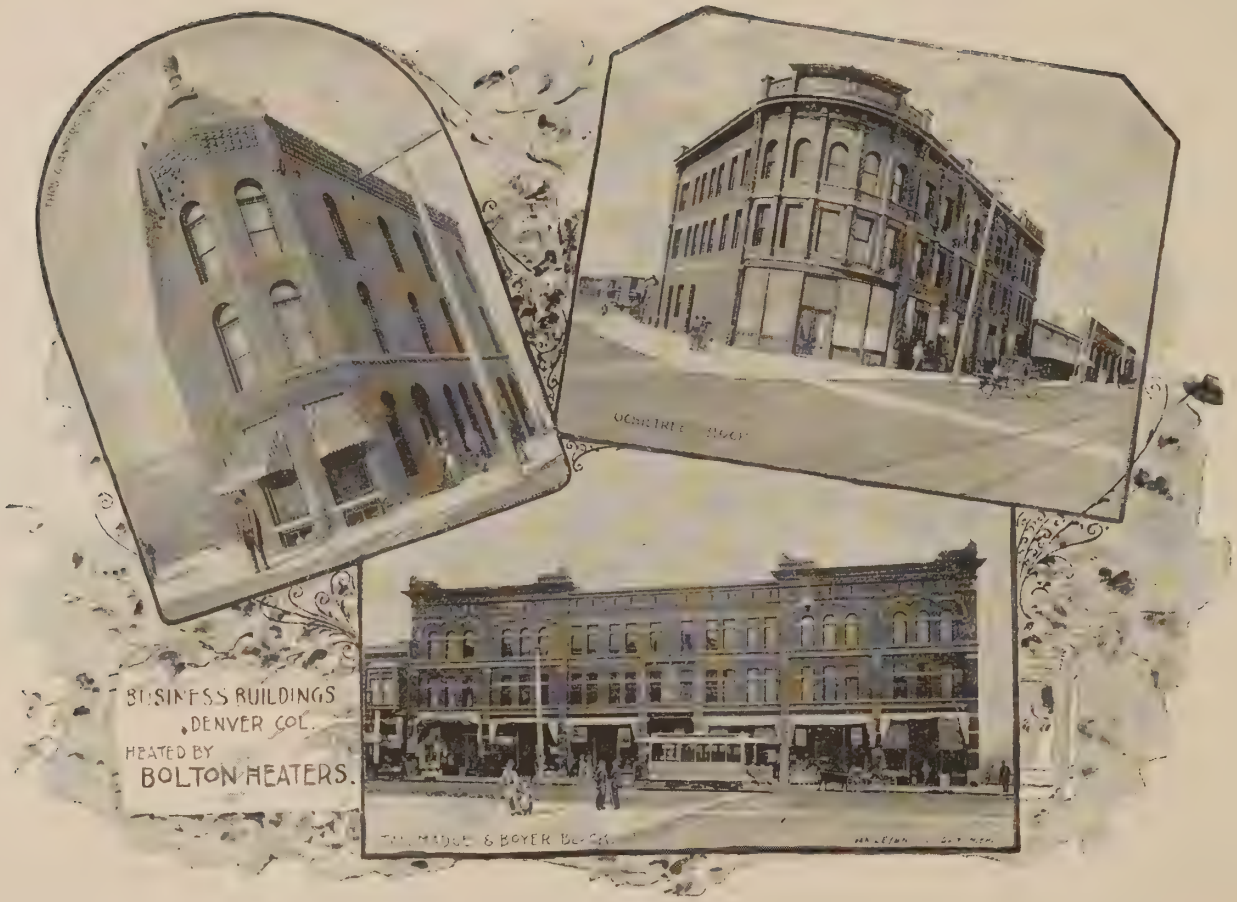
The drop tubes will not become clogged with sediment, and therefore cannot burn. They are so constructed that the water in them circulates with such rapidity and force that no sediment or dirt can lodge in them. If any deposit is left in the system it will be some remote portion, far from the boiler. We make this statement for the benefit of those who might be misled by an absurd argument of some of our competitors. As a matter of fact, the same water is continually used, with little replenishment; and so, even if it were foul and highly charged with mineral substances there would not be enough of these in the small quantity of water used to form a visible scale in many years.

We strongly recommend covering pipes in cellars, and wherever heat is not required. This is a measure of economy, as it saves fuel and promotes the efficiency of the heater.

In calculating what size of Heater is required for a building, consideration should first be given to the following conditions, viz: The character of the building and the purpose for which it is to be used;the amount of window surface; the climate and exposure; the material of the building and its construction—that is, whether poorly, fairly or well built.

The amount of radiating surface should be calculated at 20 to 35 square feet for each 1,000 cubic feet of space to be heated, varying according to the floors and the above conditions.

Space to be heated by indirect radiation requires about fifty per cent. more radiating surface than would be allowed it if direct radiation were used.



See Testimonial, Tallmadge & Boyer, page 47.

To the amount of required radiating surface thus obtained, 25 per cent. should be added for the mains, or flow and return pipes, which are really radiating surfaces.

Having arrived at the amount of radiating surface required, in ordinary cases, our price list shows approximately what size Heater will supply it.

Customers and dealers requiring estimates or ordering heaters will please fill out the accompanying blank and mail to us, with plans of the building to be heated.

Our Heaters are carefully tested and ABSOLUTELY GUARANTEED.

DETROIT HEATING AND LIGHTING COMPANY,

SOLE MANUFACTURERS

BRANCHES:

NEW YORK, 126 Liberty Street.

CHICAGO, 88 Lake Street.

BOSTON, 42 Pearl Street.

ST. LOUIS, 414 North Broadway.

FACTORY
AND HOME OFFICE,

DETROIT, MICH.

ATLANTA, GA., RESIDENCES HEATED BY BOLTON HEATERS.

DIMENSIONS, CAPACITY AND PRICE

DETROIT

· BOLTON · HOT · WATER · HEATER ·

DETROIT HEATING & LIGHTING CO.,
SOLE MANUFACTURERS.

PRICE SUBJECT TO CHANGE WITHOUT NOTICE.

SEPT. 1ST, 1892.
SUPERSEDES ALL PREVIOUS LISTS.

NUMBER OF BOILER.	SINGLE FIRE POT.					DOUBLE FIRE POT.					TRIPLE FIRE POT.			NUMBER 20 SERIES FOR HEAVY WORK,		
	1	**2**	**3**	**4**	**5**	**5½**	**6**	**7**	**8**	**8½**	**9**	**10**	**10½**	**20**	**25**	**30**
Dimensions of Heater. Height in inches,	43	43	43	43	43	43	43	43	43	43	43	43	48	49	49	49
Width " "	21	21	21	21	24	38	38	38	44	58	57	66	66	39	78	118
Depth " "	21	25	30	32	32	25	27	32	32	33	32	32	32	49	44	49
Dimensions outside of Brick. Height in inches,	65	65	65	65	65	65	65	65	65	65	65	65	72	73	73	73
Width " "	34	37	37	37	40	54	54	54	60	74	73	82	82	70	109	174
Depth " "	34½	37	42	44	44	37	39	44	44	45	44	44	44	72	72	72
Dimensions of Fire Pot. Height in inches,	13½	13½	13½	13½	15	13½	13½	13½	15	13½	13½	15	15	16	16	16
Width " "	17	17	17	17	20	17	17	17	20	26	17	20	20	33	33	33
Depth " "	17	21	26	28	28	21	24	28	28	28	28	28	28	43	43	43
Size of Grate	15x15	19x15	23½x15	25½x15	25½x17	19x30	21x30	25½x30	25½x34	25½x47	25½x45	25½x51	25½x51	40½x30½	40½x61	40½x91½
Diameter of Smoke Pipe	7	7	7	8	8	9	9	9	9	12	12	12	12	12	14	18
Square feet of Fire Surface	56	80	92	97	110	129	155	180	216	245	266	302	348	249	498	747
Square feet Radiation Heater will carry	**380**	**475**	**570**	**630**	**715**	**903**	**1100**	**1300**	**1728**	**2205**	**2384**	**2718**	**3132**	**2500**	**5000**	**7500**
Number of Openings, Flow and Return.	4	4	4	4	4	6	8	8	8	8	12	12	12	8	16	24
Size of Openings in inches (Regular)	2	2	2	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4
Number of Brick required to set Heater.	500	600	650	700	850	925	950	1000	1050	1100	1100	1200	1250	1200	2000	3500
Shipping weight of Heater	850	975	1125	1200	1320	1800	1900	2180	2370	3450	3635	3800	4000	3500	7200	10700
Price, f. o. b. Detroit	**$110**	**$125**	**$160**	**$190**	**$220**	**$275**	**$300**	**$350**	**$425**	**$500**	**$525**	**$650**	**$700**	**$650**	**$1300**	**$2,000**

For Numbers 1, 2, 3, 4, Stove and Small Egg Coal, Mixed, is best suited. For the others, Small Egg gives the best result. Good quality soft coal or natural gas are also suitable fuel.

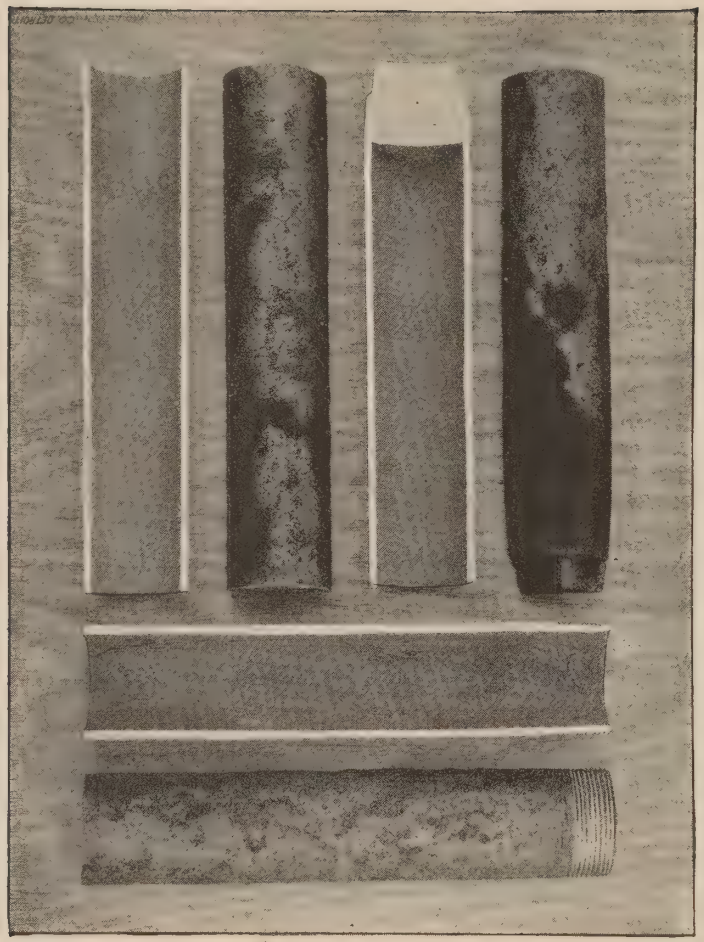
Above rating is for Direct Radiators. If Indirect Radiation is used, its surface should be increased by one-half in calculating size of boiler to be used.

Flow and Return Openings tapped 2 to 4 inches unless otherwise ordered.

CAPACITY GUARANTEED TO EXCEED PUBLISHED RATING.

* This rating is with uncovered Mains. WITH MAINS COVERED HEATER WILL CARRY FROM **10 to 15 per cent. more.**

Repairs, in ordering please state in what year heater was ordered. If soft coal is intended for fuel, so state in ordering.



Drop Tube Sawed Up AFTER 15 YEARS' USE Without Cleaning.

DURABILITY OF DROP TUBES IN BOILERS.

SILSBY MANUFACTURING CO.

SENECA FALLS, N. Y., July 31, 1890.

GENTLEMEN:—We are just repairing the boiler of an engine of our make. This boiler has been in use since 1875, and we take pleasure in sending you a few of the old tubes which we are taking out of it. The engine, when in use, has been subjected to severe test, and we send the tubes just as they were taken from the boiler, as we thought perhaps you would like to have them in that shape.

Yours very truly,

THE SILSBY MANUFACTURING CO.

⁘

We show herewith reproduction of a photograph of one of the tubes above referred to, which we had sawed up, taking great care to avoid displacing even the soot on its outside. It is, therefore, shown exactly as taken from the boiler, and we think the clean inner surfaces will show the freedom of drop tubes f om scale or sediment. Their use in Steam Fire Engines subjects them to a much severer trial than they are ever subjected to in the Bolton Hot Water Heater, *and the uniform and even thickness of the pipe shows it to be good for still another 15 years, and that the attacks of interested competitors are without justification.* See also opposite page.

UNITED STATES CONSULATE,

PETERBOROUGH, CANADA,
Oct. 24, 1890.

GENTLEMEN:—I have had a Bolton Hot Water Heater, the same as shown in your Catalogue, in use in my residence for the last seven years.

At the request of the Brooks Manufacturing Co., the Canada makers of this boiler, we lately took out some of the drop tubes and examined them. They were perfectly clean and free from sediment, although having been in use, as above stated, for seven years.

Yours very truly,
A. V. R. YOUNG.

"Bolton Used 6 Years—No Sediment."

CANADA SAVINGS & TRUST COMPANY,

PETERBOROUGH, ONT.,
Aug. 1st, 1890.

GENTLEMEN:—The Bolton Hot Water Heater and heating coils were put in my house in the fall of 1884, so that I have had six winters' experience. Mr. Braden took out a tube last fall, and it is a satisfaction to know that the inside lower end was as clean as when first put in, showing that sediment does not settle in the tube as some contended it would.

I have made a study of heating by hot water during the last fifteen years, not as a business, but as a subject in which I took a natural interest. I might add that after the first or second winter, I did not take trouble to put in storm sash.

Yours truly, F. E. BELL.

"25 Years in Use, and Good as when First put in.

GARTH & CO., DOMINION METAL WORKS.

MONTREAL, QUE., July 26, 1890.

GENTLEMEN:—We have been making Tubular Hot Water Boilers for the last thirty years, and have never yet found a boiler to rust out in the joints. We have just replaced by a larger one a boiler that has been working for the last twenty-five years. That part of the pipe where it screws into the bend is as good as when first put in, so are the bends; but the pipe exposed to the action of the fire has slightly deteriorated.

We have lots of boilers in the Dominion put up twenty years ago, working as well to-day as ever.

Yours respectfully,
GARTH & CO.

"No Sediment after 13 Years—Using Surface Water."

OBERLIN, OHIO, May 11th, 1891.

GENTLEMEN:—I had charge of a Silsby Boiler for seven and one-half years. The water had not been taken out of the drop tubes for thirteen years, when I took it out myself. I drew the water from eighteen of these tubes into a clean pail and there was not one-half gill of sediment in the whole of them, and the inside of these tubes was as clean as when new. The water we used came from reservoirs in the street, which were filled from the surface water when it rained. So you see it was not clean water that kept the sediment out of the tubes, but the circulation of the water.

Yours,
J. L. MILLER,
Late Silsby Engineer.

Baptist Church, Dallas, Texas.

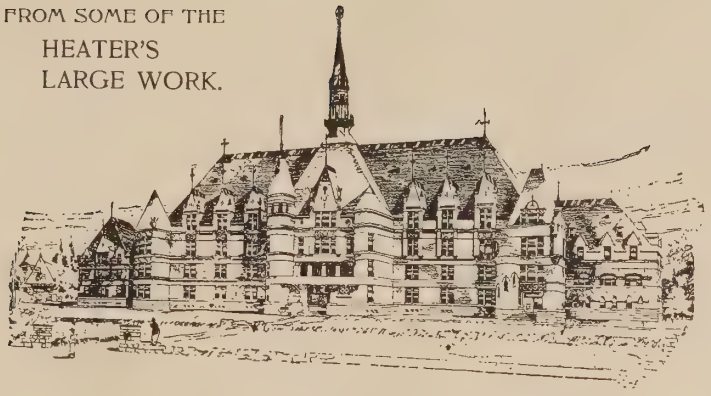
HEATED BY BOLTON HEATER.

Albert Ullrich, Architect, Dallas, Texas.

SOME LARGE BOLTON WORK.

	Feet of Radiation.
Convent of the Visitation, St. Louis, Mo.	27,000
St. Anthony's Hospital, Columbus, O.	13,000
Dunn County Insane Asylum, Menominee, Wis.	10,500
Woman's Hospital & Foundlings' Home, Detroit, Mich.	10,000
Kiser Office Building, Atlanta, Ga.	9,000
New Engelberg Abbey, Conception, Mo.	8,500
Credit Office Building, Newark, N. J.	7,000
Oberlin Theological Seminary, Council Hall, Oberlin, O.	6,200
Hackley Public Library, Muskegon, Mich.	6,000
St. Mary's Hospital, Pueblo, Colo.	5,500
Bank of McKeesport, McKeesport, Pa.	4,700
Weinstock-Lubin Building, Sacramento, Cal.	4,500
Grand Hotel, Beaver Falls, Pa.	4,400
Tallmadge & Boyer Block, Denver, Colo.	4,000
Kate P. Nelson Seminary, Shreveport, La.	4,000
Masonic Temple, New Albany, Ind.	3,600
City Hall, Mt. Clemens, Mich.	3,600
St. Aloysius Academy, New Lexington, O.	3,400
Home for Jewish Aged and Infirm, Cincinnati, O.	3,000

FROM SOME OF THE
HEATER'S
LARGE WORK.



Convent of The Visitation, St. Louis, Mo.

Barnett & Haynes, Architects.

27,000 Feet of Radiation. HEATED BY BOLTON HEATERS.

St. Anthony's Hospital.

COLUMBUS, OHIO, Feb. 6, 1892.

GENTLEMEN:—The Bolton Hot Water Heaters which you placed in our Hospital last year we are pleased to say give us perfect satisfaction, and it is no small comfort to have such a large building heated uniformly mild and pleasant.

It proves to be especially adapted for hospital purposes, not only for the healthful and mild atmosphere it produces, but also of being entirely noiseless and very clean, all of which is a great comfort to the sick.

Above all, we are pleased with the easy management of the apparatus, and of being absolutely safe. Therefore we do not hesitate to say that we like the Bolton Hot Water Heater the best for hospitals, and will ever recommend it highly.

Very respectfully yours,
SISTERS OF THE POOR OF ST. FRANCIS.

Masonic Temple.

NEW ALBANY, IND., Feb. 2, 1892.

GENTLEMEN:—No complaint has been made by any of the occupants of our building, even during the coldest weather. The building is 68 x 122 feet, the third story has a 20 foot ceiling. We have never had occasion to use more than two-thirds of the heater's capacity. We have more than a mile of pipe in the building. The heat is the best, most regular and pleasant of any that I have ever seen.

Respectfully,
JONATHAN PETERS,
Pres. Masonic Bldg. Ass'n.

Home for Jewish Aged and Infirm.

CINCINNATI, Jan. 22, 1892.

GENTLEMEN:—We have for two years in the Home for the Jewish Aged and Infirm used your Bolton Hot Water Heaters. In the coldest weather the heater gives us a temperature from 68 to 70 degrees, and we are well pleased with their workings and the fair treatment we have received from you.

We can cheerfully recommend the Bolton Hot Water Heater and the Detroit Heating & Lighting Co. to all desiring a first-class heating apparatus.

Yours truly,
JAMES LOWMAN, *Pres.*

Kiser Building.

ATLANTA, GA., April 8, 1892.

GENTLEMEN:—We take pleasure in recommending the Bolton Hot Water Heater as one that has given the best results in our most recent buildings, both for residences and public buildings.

The large office building erected for Mr. M. C. Kiser, of this city, is most satisfactorily heated by your heater, and during the past winter kept fully up to your guarantee.

We will cheerfully recommend you in our future work from our experience with your Bolton Hot Water Heat r.

Very respectfully,
BRUCE & MORGAN,
Architects.

(Cut of building on page 24.)

EXTRACTS FROM RECENT LETTERS.

The Best Heated House We Ever Had.

ROCHESTER, N. Y., April 11th, 1892.

We are more than pleased with your Bolton Hot Water Heater, as we have had the best heated house we ever had, and that with a saving of 25% in coal over that formerly required when using furnace or steam, and we have used both.

WM. S. CASTLEMAN,
Leather Dealer.

Its Double Fire Pot Arrangement is a Great Success.

ST. LOUIS, MO., April 17th, 1892.

The Bolton Hot Water Heater in my residence has fully met my expectations, and is in every respect all claimed for it. I consider it one of my best investments. The summer-like temperature and economy in fuel we derive from it is beyond what I anticipated, and the double fire pot arrangement is a great success.

FRANK NAGEL.

MARSHALL FIELD & CO'S
Department Supt.,

Mr. A. H. DAINTY, writes,—

CHICAGO, Feb'y 19th, 1892.

It gives me pleasure to write that the Bolton Hot Water Heating plant, which you put in my house one year ago, has given us perfect satisfaction in every respect. In my judgment, for house heating, there is nothing equal to it.

MRS. DAINTY also says,—

I wish to say a few emphatically good things to you in regard to the Bolton Hot Water Heater. We find the Heater very easily managed, thorough in its work, even in temperature if desired, or responding very quickly to a call for more heat, extremely clean, and above all, perfectly quiet.

As a housekeeper of a good many years' experience, I consider it the very best heat that can be used, far excelling anything I have ever seen.

One of the Best Investments of my Life.

HAMPTON, IA., March 23d, 1892.

The purchase of the Bolton Hot Water Heater which I have in my residence, I consider one of the best investments of my life. The comforts and advantages to be derived from it must be enjoyed to be appreciated.

I take great pleasure in recommending your Bolton to all desirious of adopting the hot water system, believing it to be equal, if not superior, to any on the market.

J. F. LATIMER,
Pres. Bank of Hampton.

Unvaried Satisfaction—House Isolated and Exposed to Lake Winds.

LAKE GENEVA, WIS., April 4th, 1892.

The Bolton Hot Water Heater gives entire satisfaction. The house is very large and particularly isolated and exposed to lake winds, but we are accustomed to a regular and comfortable temperature in every room day and night. This has been our third winters' experience with the Bolton and our satisfaction has been unvaried.

ALVAN E. TYLER,
Pres. First National Bank.

No Sediment After Four Years' Use with Mississippi River Water.

NEW ORLEANS, LA., March 7th, 1892.

The Bolton Hot Water Heater placed in the Howard Memorial Library gives perfect satisfaction. We find it never necessary to use more than two-thirds the Heater's capacity to maintain proper temperature.

I was present when four of the drop tubes were removed after four years' use, and saw that they were free from sediment, although the water used is from the muddy Mississippi.

WILLIAM BEER,
Librarian.

EXTRACTS FROM RECENT LETTERS.

Perfect Satisfaction.

ALBANY, N. Y., March 30th, 1892.

Your heater has given us perfect satisfaction the past seasons. It is easily cared for, and the heat is even and delightful. Our residences are situated in as cold a place as there is in our city, but we have had no trouble to keep warm in every room in the coldest weather.

J. H. & F. A. MEAD,
Commission Merchants.

Without Comparison.

WEST SUPERIOR, WIS., April 4th, 1892.

The Bolton Hot Water Heater placed in my residence in West Superior last fall has given perfect satisfaction. I put in six of your plants in Duluth in 1890, and have seen no other kind that will compare with it, although I have examined many. I prefer the Bolton to all others, and would not use any other.

C. S. BARKER,
Contractor for Public Works

Everything Works Like a Charm.

NEW YORK CITY, April 7th, 1892.

I am pleased to express my appreciation of your Bolton Hot Water Heater. Everything works like a charm; and to live in a house heated by hot water, after one heated by hot air, is like entering upon enchanted ground.

CHARLES DWYER,
Butterick Pub. Co.

Saved 25 per cent in Coal this Winter.

HOT SPRINGS, ARK., March 4th, 1892.

My heater works splendidly, and is far ahead of any apparatus I know of. I have saved 25% in coal this winter. The air or heat is soft and pleasant, not stifling or choking. We would not give up the Bolton Hot Water Heater for anything.

G. G. LATTA, *Lawyer.*

Full Value for Fuel Burned.

ERIE, PA., April 11th, 1892.

The Bolton Hot Water Heater in my residence has given excellent results. I find the heating capacity very high, and the circulation is perfect. The way in which the heating surface is exposed to the fire gives full value for the fuel burned, and consequently is a great saving in the matter of fuel.

A. H. JARECKI, *Sec. Jarecki Mfg. Co.*

The Bolton the Right One.

EAST GRAFTON, N. H., March 31st, 1892.

Before purchasing a heater I looked over several different kinds and obtained all the information possible concerning them, and from all I could learn I was satisfied the Detroit Bolton was the righ one.

I am happy to say that after a winter's experience I have no reason to change my mind.

I am satisfied that your Bolton is the heater that takes least amount of coal to produce the desired results, and requires the least attention.

E. F. FOLSOM, *Silver Grey Granite Co.*

The Bolton Succeeds where Others Fail.

DENVER, COLO., April 11th, 1892.

Our three story building and basement, containing 268,125 cubic feet to be heated, has been successfully heated by your Bolton Heater.

We are led to believe in the superiority of the Bolton by the fact that we first put in a heater of another manufacture and of presumed ample capacity, but which was found to be unable to heat the building.

We then without change of piping substituted the Bolton and it performed the work. We desire to express our unqualified commendation of the Bolton Heater as to efficiency and economy. Yours, etc., TALLMADGE & BOYER.

(Cut of Building on Page 38.)

EXTRACTS FROM RECENT LETTERS.

"What More Could I Ask?"

(FROM A GREENHOUSE MAN.)

PORT HURON, MICH., Dec. 10, 1891.

The Bolton Hot Water Heater in my greenhouse has been given a thorough trial. I am prepared to say it has stood the test without showing a single defect. What I regard as one of the chief points in a perfect hot water heater for greenhouse work is to obtain a rapid circulation in a short time with a small amount of fuel, and I have it in the Bolton.

As for its fire holding qualities, when I leave it at evening it is with perfect confidence that I shall find a good, warm house in the morning, and it never disappoints me. Last, but not least, it is very economical in fuel, and to sum the matter up, it is perfect in all good points that go to make up an ideal hot water system of heating, and in the matter of fuel puts money in my pocket. What more could I ask?

If I had twenty houses to heat, would not hesitate an instant in giving my orders for your Bolton Hot Water Heater.

HIRAM PRESLEY,
Florist.

"The Acme of Perfection."

CLEVELAND, OHIO, Feb'y 4, 1892.

The heater is O. K. It is the "Acme of Perfection." Works like a charm.

The beauty of the Bolton is its economy, both in fuel and labor, firing but twice in 24 hours, morning and evening. I have had experience with several heaters, but the Bolton beats them all. I have a large house to heat, equal to 17 very large rooms; the cost for heating same up to this time has not exceeded three cents per room for 24 hours. This may seem incredible, but "the proof of the pudding is in the eating," and I have been to the feast, consequently I know whereof I affirm.

J. W. FOX,
Grasselli Chemical Co.

From the Group on Page 20.

Feb. 26, 1892.

I have used your heater for the past two winters; am very well pleased with it. It has been entirely satisfactory to us. I cheerfully recommend it.

W. S. BOOTH.

Feb. 25, 1892.

I have used your hot water heater nearly two winters. It gives great satisfaction, and would recommend the same in preference to any I know.

T. P. SMITH.

Feb. 26, 1892.

The Bolton Heater has been used two seasons, giving a very pleasant and even heat; am very much pleased with it.

FRED. W. SMITH.

Feb 26, 1892.

Your heater has given us a steady, pleasant heat. Much superior to steam or hot air.

GEO. T. SMITH.

"The Pride of the Family."

SPRINGFIELD, OHIO, Feb'y 2, 1892.

I could not say half enough in praise of your Bolton Hot Water Heater. It is clean and so simple that a child can manage it. It requires not as much attention as a base burner, and with the same amount of fuel we can heat our whole house, attic and all.

You may refer any one to me and I will gladly show them the pride of our family, the Bolton.

DR. G. W. MUNN.

EXTRACTS FROM RECENT LETTERS.

40° Below Zero Outside—75° Above Zero Indoors.

MINNEAPOLIS, MINN., Feb. 1, 1892.

I have two Bolton Hot Water Heaters in my double house, and while the thermometer was down as low as 40° below zero outside, we had no difficulty in keeping it 75° above within.

I assure you that if I could not get another Bolton I would not have them removed for double the amount of money they cost me. E. P. CALDWELL,

Pres. Heath Rail Joint Co.

What the Bolton Does with a 30° Below Zero Temperature.

LINCOLN, NEB., Feb. 2, 1892.

The Bolton works better than ever, if such were possible. During the recent very cold weather there was sickness in my family, and it was necessary to maintain an even temperature all over the house. It was not difficult to keep the thermometer at from 74° to 76° all the time, and I could have maintained it at 80°. With an outside temperature very low, sometimes 30° below zero, the temperature of my house was never lower than 70° above.

J. H. MOCKETT, JR.,

N. W. Mutual Life Ins. Co.

25° Below Zero—No Trouble to Keep Warm.

ST. JOSEPH, MO., Jan. 28, 1892.

My Bolton Hot Water Heater has stood the test of the recent cold weather splendidly. The temperature of my rooms has been 68 and 70 degrees during the cold weather, and that without any special effort. I heat every one of my rooms, the doors between halls and rooms standing open the same as in warm weather.

The thermometer has ranged here as low as 25° below zero.

CHAS. S. KEMPER,

Kemper, Hundley & McDonald Dry Goods Co.

46° Below Outside—Didn't Feel It in the House.

MARQUETTE, MICH., Feb. 6, 1892.

The Bolton Hot Water Heater worked splendidly during the recent cold weather. Could not wish for anything better. The thermometer has shown as low as 46° below zero, but no matter how cold it is outside, we don't feel the cold in our house, having a Bolton Heater. JACOB DOLF,

Deputy Sheriff.

"Solid Comfort" 16° Below Zero.

LISBON, IA., Jan. 28, 1892.

I am more than pleased with the Bolton Heater. I can not say too much in commendation. We have solid comfort, even temperature almost day and night, and can have what we want, no matter how cold the weather. It is less trouble than a hard coal base burner. 16° below zero the other morning. A. RUNKLE.

33° Below—House easily Heated—Heater under Check.

LEXINGTON, NEB., Jan. 30, 1892.

In justice to yourselves and heater would say, the Bolton gives me pleasure and satisfaction in every respect.

Have just had a very cold spell of weather, the thermometer registered 33° below zero. I could heat my house easily with only one fire pot. We never use both only in very cold blizzards. I. W. OLIVE.

20° Below—Verona, Wis.

FEB. 2, 1892.—The Bolton Heater has worked well indeed. Our building most comfortable with the mercury 20° below zero outside. It certainly is a fine heater, and I can not see how the Bolton could be improved upon.

J. S. MYERS,

Supt. Dane Co. Asylum.

GENERAL REFERENCES.

ONLY A FEW NAMES OF THE THOUSANDS OF SATISFIED USERS.

AKRON, O., ... B. F. Goodrich Co., Office Building
ALBANY, N. Y., . . J. H. & F. A. Mead, Commission Merchants
ALBION, IND., ... C. M. Clapp, Banker
ALLEGHENY, PA., ... W. J. Langenheim, Wholesale Grocer
ALTOONA, PA., . . . John Lloyd, Cashier First National Bank
AMHERST, MASS., ... S. A. Phillips, Hardware
ASHLAND, WIS., ... E. F. Gleason, Lawyer
ATLANTA, GA., ... T. B. Neal, Neal Loan & Banking Co
AUSTIN, TEXAS, . . Eugene Bremond, Pres. State National Bank

BALTIMORE, MD, . . . C. C. Homer, Pres. Second National Bank
BAY CITY, MICH., ... Selwyn Eddy, Lumber
BAY ST. LOUIS, MISS., ... E. I. Prentice, Capitalist
BOSTON, MASS., . C. F. Brown (Wright, Brown & Crossley, Lawyers)
BRIDGEPORT, CONN., ... J. C. Fowler, Real Estate
BUFFALO, N. Y., ... E. Van Brocklin, Fire Commissioner
BURLINGTON, N. C., ... J. Q. Gant, Altamaharo Cotton Mills

CARLYLE, ILL., ... G. Van Hoorebeke, Lawyer
CHARLESTON, S. C, ... M. Marks, Dry Goods
CHATTANOOGA, TENN., . J. H Warner, Pres. Fourth National Bank
CHICAGO, ILL., ... Hon. Hempstead Washburne, Mayor
CINCINNATI, O., ... Wm. Morlein, Morlein Brewing Co
CLEVELAND, O., ... John W. Fox, Grasselli Chemical Co
COLUMBUS, O., ... St. Anthony's Hospital
COSHOCTON, O., ... J. P. Forbes, Lawyer

DALLAS, TEXAS, . . J. S. Armstrong, Pres. Fourth National Bank
DAVENPORT, IA., ... Fred Heinz, Lawyer
DENVER, COLO., . . R. W. Woodbury, Pres. Union National Bank
DES MOINES, IA., . . H. J. McDonald, Baker Wire Co., Chicago
DETROIT, MICH., . . . David Carter, Gen. Mgr. D. & C. S. N. Co
DULUTH, MINN., O. G. Traphagen, Traphagen & Fitzpatrick, Architects

EAU CLAIRE, WIS., ... E. S. Hammond, Lumber
ERIE, PA., ... A. H. Jarecki, Jarecki Mfg. Co

FORT SMITH, ARK., ... Geo. H. Lyman, Real Estate
FORT WORTH, TEXAS, ... St. Paul's M. E. Church
FREMONT, NEB., ... Commercial National Bank

GALVESTON, TEXAS, ... Broadway School
GRAND RAPIDS, MICH., ... Edmund Barry, Lawyer

HAMPTON, IA., . . . J. F. Latimer, Pres. Bank of Hampton
HARRISONBURG, VA., ... Hon. Chas. T. O'Ferrall, M. C
HELENA, MONT., ... St. John's Hospital
HOLYOKE, MASS., ... Dwight Kelton, Merchant
HOT SPRINGS, ARK., ... G. G. Latta, Lawyer
HOUSTON, TEXAS, M. G. Howe, Houston, East and West Texas R'y
HUNTINGTON, IND., . E. K. Alpaugh (Slack & Alpaugh), Lumber

INDEPENDENCE, IA., . . C. W. Williams, Rush Park Stock Farm
INDEPENDENCE, MO., ... Logan O. Swope, Capitalist

JACKSON, MICH., ... Hon. A. J. Weatherwax, Mayor
JACKSON, MISS., ... Mary Holmes Seminary
JACKSON, TENN., ... D. M. Irwin, Lawyer

KANSAS CITY, KAN., ... First National Bank Building
KANSAS CITY, MO., ... Chas. R. Hicks, Real Estate
KEARNEY, NEB., . . J. J. Bartlett, Kearney Milling & Elevator Co
KENDALLVILLE, IND., . David C. Walling, Flint & Walling Mfg. Co
KNOXVILLE, TENN., ... F. C. Richmond, Coal Agent

LA CROSSE, WIS., . J. M. Holley, Cashier State Bank of La Crosse
LAKE GENEVA, WIS., . Alvan E. Tyler, Pres. First National Bank
LANSING, MICH., ... B. F. Davis, Cashier City Bank
LA PORTE, IND., ... J. H. Bradley, Lawyer
LE GRAND, IA., ... Le Grand Christian College
LEXINGTON, MO., Robt. Taubmann, Pres. Commercial National Bank
LINCOLN, NEB., ... J. H. Mockett, Jr., N. W. Life Ins. Co
LOCKPORT, N. Y., ... W. H. McCoy, Publisher
LOS ANGELES, CAL., ... Geo. R. Weeks, Real Estate

LOUISVILLE, KY., . . Theo. Harris, Pres. Louisville Banking Co
LOWELL, MASS., ... James Whittet, Contractor
LYNN, MASS., ... Wm. Forsyth, Carpenter

MACON, GA., ... Exchange Bank Building
MADISON, WIS., ... E. R. Shepherd, Lyman Lumber Co
MARENGO, IA., ... Dr. W. Schultze
MERIDEN, CONN., ... Henry Dryhurst, Postmaster
MICHIGAN CITY, IND , . . . N. P. Rogers, Haskell & Barker Car Co
MILWAUKEE, WIS., ... Philip Gross, Hardware
MINNEAPOLIS, MINN., . E. P. Caldwell, Pres. Heath Rail Joint Co
MT. CLEMENS, MICH., ... Mt. Clemens Savings Bank
MUSKEGON, MICH., ... Hon. C. H. Hackley

NASHVILLE, ILL., ... Washington County Bank
NASHVILLE, TENN., ... Chas. Nelson, Greenbrier Distillery
NEWARK, N. J., ... William Halsey Wood, Architect
NEW HAVEN, CONN., ... Mrs. O. F. Winchester
NEW ORLEANS, LA., ... Whitney National Bank Building
NEWTON, IA., ... Alanson Clark, Lawyer
NEW YORK, N. Y., . Rev. Frank Russell, U. S. Evangelical Alliance
NIAGARA FALLS, N. Y., ... Cataract Bank Building
NORWALK, CONN., . Rev. Josiah Strong, U. S. Evangelical Alliance

OAKLAND, CAL., ... Wm. J. Dingee, Real Estate
OBERLIN, O., ... Wm. Evans, Contractor
OGDEN, UTAH, ... W. W. Corey, Pres. Citizens' Bank
OIL CITY, PA., ... S. Y. Ramage, Mutual Oil Co
OMAHA, NEB., ... C. Hartman, Fire Commissioner
OSHKOSH, WIS., ... National Bank Building

PHILADELPHIA, PA., ... Wm. J. Eisle, Florist
PITTSBURGH, PA., Murray A. Vernor, Pitts. & Birmingham Traction Co
PORTAGE, WIS., ... City Bank Building
PORTLAND, ORE., ... K. Stephan, Cloak Manufacturer
PUEBLO, COLO., ... T. J. Morgan, Morgan & Geiser

RACINE, WIS., ... ; . . . Leo Peil, Grocer
RENSSELAER, IND., ... E. P. Hammond, Lawyer
RICHMOND, VA., ... W. C. Rice, Merchan
ROANOKE, VA., ... A. F. Pope, G. F. A., N. & W. R. R
ROCHESTER, N. Y., ... Wm. S. Castleman, Leather Dealer
ROCKFORD, ILL., . . . Horace Brown, V. P. Bank of Rockford
ROCK ISLAND, ILL., ... M. M. Briggs, Deputy Sheriff

SACRAMENTO, CAL , ... Sacramento Bank Building
ST. JOSEPH, MO., . J. W. McAlister, Cashier Saxton National Bank
ST. LOUIS, MO., . . . Chas. M. Hays, Gen. Mgr. Wabash R. R
ST. PAUL, MINN., . . E. S. Warner, St. Paul White Lead & Oil Co
SALEM, MASS., ... J. P. Fish, Engineer
SALEM, N. C., ... Salem Female Academy
SALEM, VA., ... L. C. Hansbrough, Lawyer
SALT LAKE CITY, UTAH, ... P. L. Williams, Lawyer
SANFORD, ME., ... A. Garnsey, Jeweler
SAN FRANCISCO, CAL., Albert Gallatin, Huntington, Hopkins Hdware Co
SANTA BARBARA, CAL., ... Elwood Cooper, Olive Mill
SCOTTDALE, PA., . . . Clark Grazier, Scottdale Iron & Steel Co
SCRANTON, PA., ... Jas. P. Dickson, Dickson Mfg. Co
SEDALIA, MO., ... Geo. Wells, Wells & Craven
SIOUX CITY, IA., ... W. H. Houck, Real Estate
SPRINGFIELD, MASS., ... H. L. Niles, Grocer
SUPERIOR, WIS., ... Hon. Martin Pattison, Mayor

TOLEDO, O., ... A. M. Woolson, Woolson Spice Co
TUNKHANNOCK, PA., ... S. Judson Stark, Capitalist

UNIONVILLE, MO., ... B. H. Bonfoey, Broker

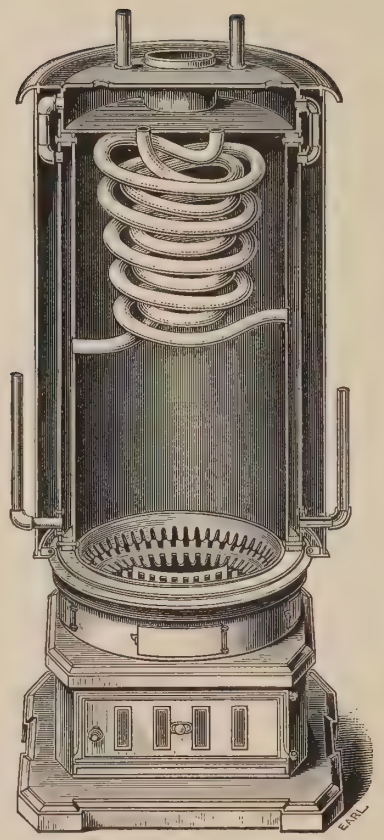
VINCENNES, IND., . H. A. Foulkes, Cashier Vincennes National Bank

WARSAW, IND., ... J. W. Curtis, Jeweler
WASHINGTON, D. C., ... Hon. Jas. McMillan, U. S. Senator
WATERLOO, IA., ... Wangler Bros., Merchants
WATERTOWN, N. Y., . . . Board of Education (Four Schools)
WELLSTON, O., . . . H. S. Willard, Pres. First National Bank
WORCESTER, MASS., ... E. A. Brewer, Drugs

YOUNGSTOWN, O., Myron C. Wick, Pres. Cartwright, McCurdy & Co

DETROIT PORTABLE HOT WATER HEATER

SECTIONAL VIEW. . .



FOR WARMING
SMALL DWELLINGS, STABLES, CONSERVATORIES, Etc.
ESPECIALLY CONVENIENT FOR SUPPLYING
Hot Water in Hospitals, Laundries, Barber Shops, Etc.

It consists of two cylinders of boiler steel, firmly riveted, forming an outer and inner shell, with a water space of 1¼ inches between.

The upper portion of the Heater is occupied by an arrangement of pipe coils for exposing the water to the heat.

The base is especially designed and constructed for simplicity and convenience, being provided with side shaking and centre dumping grate—easily operated—a deep ash pit, containing large sheet iron ash pan. The Fire Pot is made of heavy cast iron, around which is a cast iron frame provided with hinged doors on all sides, which may be opened and the clinkers and ashes removed from the surface of the grate without disturbing the fire. The shell being placed on the fire pot brings the coils sufficiently high to be out of the ashes and directly exposed to the heat of the fire. The outside casing is made of galvanized iron.

It is well made in every respect; material and workmanship are absolutely guaranteed. Many hundreds of the Heaters are in use, giving the most perfect satisfaction.

This Heater is especially adapted for use with

NATURAL GAS.

EXPANSION TANKS

FOR DETROIT HEATING AND LIGHTING CO'S

BOLTON HOT WATER HEATERS.

SQUARE TANKS, SIZES 1 AND 2.
SEPTEMBER, 1892.

With Tanks Nos. 1 and 2 a special hanging bracket is furnished without extra charge.

The measurement between centers of flow and return connections is 7 inches in Tanks Nos. 1 and 2, and in all other sizes 8 inches.

The round Tanks are made of $\frac{3}{16}$ inch wrought iron shell with cast iron heads.

The float valve connection is $\frac{1}{2}$ inch in all sizes.

This float valve connection is the only feed required from the city water supply to the apparatus.

DIMENSIONS, CAPACITY AND PRICE.

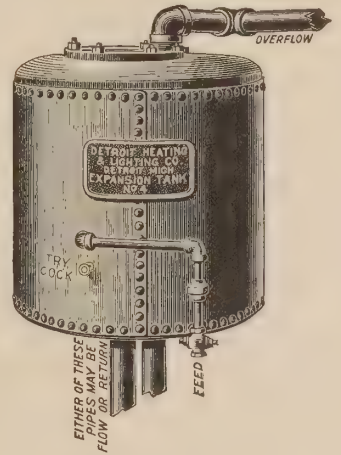
PRICES SUBJECT TO CHANGE WITHOUT NOTICE. SUPERSEDES ALL PREVIOUS LISTS.

SQUARE CAST IRON TANKS.

NO. OF TANK.	DIMENSIONS, (INCHES.)			TAPPING, (INCHES.)		CAPACITY, FEET OF RADIATION.	PRICE.	
	LENGTH.	DEPTH.	THICKNESS	FLOW AND RETURN.	OVERFLOW.		WITH FLOAT VALVE.	WITHOUT FLOAT VALVE.
1	17	13	9	1¼	1¼	400	$12.00	$ 9.00
2	24	15	12	1½	1½	1200	15.00	12.00

ROUND TANKS.

	HEIGHT.	DIAMETER.					
3	20	24	2	2	2500	$28.00	$25.00
4	26	24	2	2	4700	30.00	27.00
5	32	24	2	2	5800	32.00	29.00
6	38	24	2½	2½	7000	34.00	31.00
7	50	24	2½	2½	9300	38.00	35.00



ROUND TANK.
SIZES 3, 4, 5, 6, 7

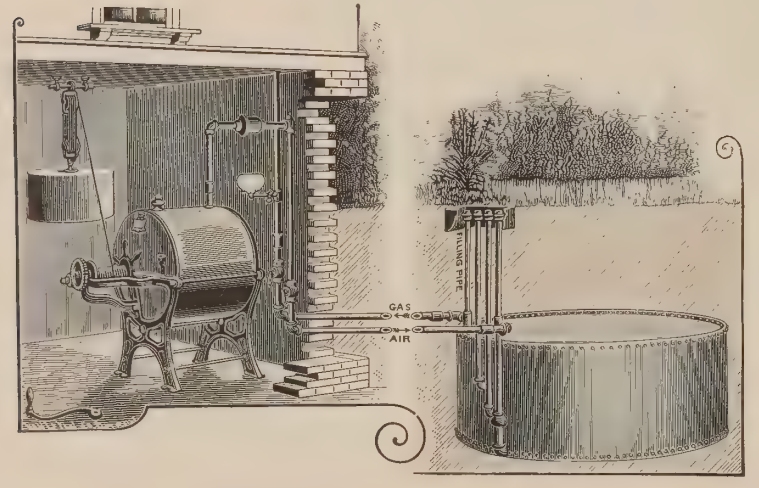
AVERAGE COST OF GAS ⅓ Cent per Hour per Burner.

COMBINATION GAS MACHINE

OVER 20 YEARS IN USE WITHOUT ACCIDENT.

BEST INDEPENDENT LIGHTING APPARATUS.

SEND FOR ILLUSTRATED BOOK
"LIGHT FOR EVENING HOURS."



For COUNTRY and SUBURBAN RESIDENCES

HOTELS, CLUB HOUSES, THEATERS,
SCHOOLS, CHURCHES, FACTORIES.

It is cheaper and better than City Gas,
Cheaper and pleasanter than Electric Light,
Simpler and safer than Oil Lamps.

It gives a soft and brilliant light,
Is free from smoke and odor,
Cannot explode, and lasts a lifetime.

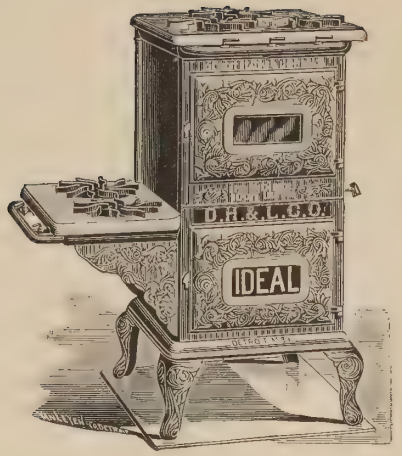
PORTLAND, ORE., April 27th, 1892.

DETROIT HEATING & LIGHTING CO.,
DETROIT, MICH.

GENTLEMEN—I am delighted with the workings of your Gas Machine. The only attention it takes is the winding once a week. I put a drum of 110 gallons of gasoline in nearly seven months ago, and the light is just as strong and clear today as when it was first charged. My light is vastly superior to the light of the city gas companies, and also cheaper. I remain,

Very truly yours,

I. HODGSON, JR., Architect.



IDEAL GAS COOKING STOVE.

GAS COOKING AND HEATING APPARATUS.

FOR COAL GAS, WATER GAS OR GASOLENE GAS.

IDEAL COOKING STOVES

Will do the work of a Kitchen Range.

IDEAL HEATING STOVES

For rooms where a quick but not continuous heat is required.

GAS GRIDDLES

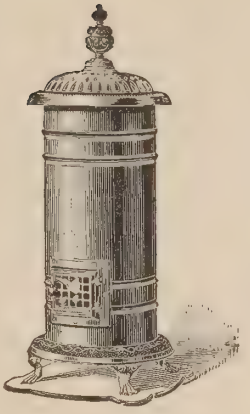
For baking cakes, frying oysters, etc.

IDEAL BURNERS

Connected to any gas jet in a moment.
HOT WATER QUICK.

Tinners' Fire Pots. Laboratory Burners. Smoothing Iron Heaters.

SEND FOR SPECIAL CATALOGUE.



IDEAL
GAS HEATING STOVE.

FUEL GAS

SEND
FOR CIRCULARS.

WE also make Gas Plants especially adapted for use in the Mechanical Arts for BRAZING, SOLDERING, etc. This is of special interest to

Can Makers, Canning Establishments, Watch-Case Manufacturers,

and wherever Fuel Gas is useful.
For such work we can produce Gas at 40 cts. per thousand cubic feet

BRONZING LIQUID.

Best Vehicle in the Market for the Application of Bronzes. Unaffected by the Heat. Preserves the Bronze effect under all conditions.

AIR DRYING DULL BLACK JAPAN.

For producing a Wrought Iron or Antique effect on Chandeliers, Architectural Iron Work, Hardware Specialties. One Coat produces an elegant finish.

AIR DRYING DULL WHITE JAPAN.

For Registers, being unaffected by the heat. It also makes an artistic background for gilt or other ornamentation. It dries with a white lustreless finish.

MAROON JAPAN.

Especially adapted to Radiator work. Most durable, dries in two hours with a brilliant and permanent lustre. A good finish for exposed water pipes, etc.

RADIATOR BRONZES and ENAMELS

IN ALL SHADES.
A FULL LINE.

SEND FOR SPECIAL CIRCULARS, PRICES, SAMPLES, ETC.

PURE SPIRITS

GASOLENE FOR GAS MACHINES

GIVES UNIVERSAL AND UNFAILING SATISFACTION
IN ALL MAKES OF GAS MACHINES.

We Solicit the Patronage of Gas Machine Users.

Our experience as builders of Gas Machines enables us to judge of their requirements. It is to our interest, as well as that of the user, that our Gas Machines operate perfectly.

FACTS ABOUT

HARD OIL FINISH.

AN EXTRA FINE JOB.

N these days of artistic interior decoration, it frequently happens that the highest and best results are demanded on the woodwork, the cost being a secondary consideration.

Perhaps the prevailing woods are very light and delicate in color—White Maple may be, or White China Finish, or possibly some of the invisible tints in Porcelain Enamelling, which it is necessary to preserve unsullied.

In this emergency the choice as to varnish is decidedly limited, as in addition to its adaptability in other respects it must be extremely light in color, or the wood will be perceptibly darkened and the delicate beauty of the finish marred. For this class of work and for all "extra fine jobs," whether light or dark woods, there is one finishing material that is absolutely reliable always—White Hard Oil Finish—*originated and made only by us.*

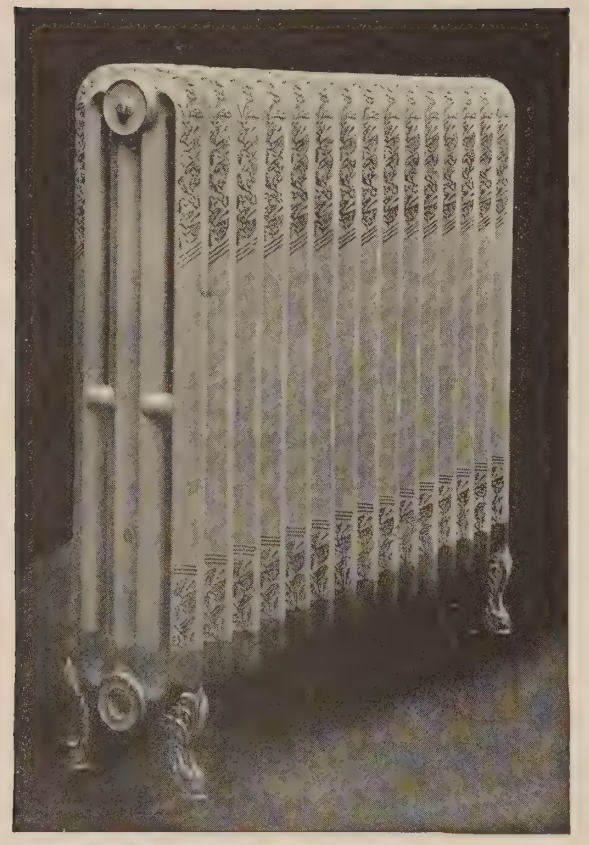
White Hard Oil Finish is peculiarly adapted for the finest interior work; being almost colorless it will not stain the lightest tints, and it possesses besides all those other sterling qualities that have made Hard Oil Finish the best known and most widely adopted interior finish in the country.

The fact must never be lost sight of however, that although Hard Oil Finish is made only by us, the name is widely counterfeited, and is bestowed indiscriminately upon a number of worthless varnishes.

Whether specifying the *White, Light or Walnut* Hard Oil Finish, always write our name in connection it you want the genuine goods used; for instance, for a special or "extra fine job," as referred to above, specify "BERRY BROTHERS' WHITE HARD OIL FINISH."

NEW YORK, CHICAGO,
BOSTON, CINCINNATI,
PHILADELPHIA, ST. LOUIS,
BALTIMORE, SAN FRANCISCO.
Factory: DETROIT.

BERRY BROTHERS,
VARNISH MANUFACTURERS.



THE

"STANDARD" RADIATORS

MANUFACTURED BY

The Standard Radiator Co.,

BUFFALO, N. Y.

Among the points of superiority claimed for this Radiator, are the following:

PERFECTION of Castings, combining the maximum of strength and the minimum of weight.

Simplicity and perfection of construction.

Artistic Ornamentation.

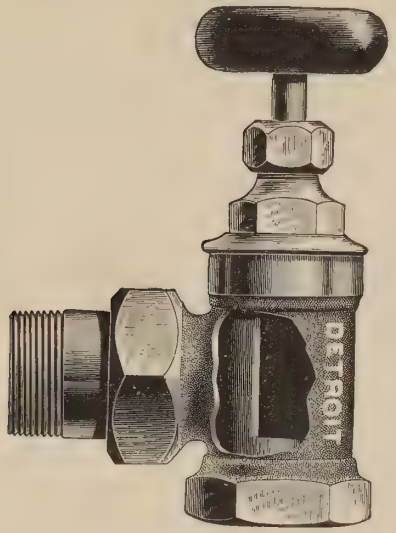
Absolutely tight joints, formed by slightly tapering connecting nipples.

Perfect and rapid circulation of water.

VERY LARGE RADIATING SURFACE IN PROPORTION TO WATER CARRIED BY THE RADIATOR.

Full measurement of heating surface claimed for the different sized sections.

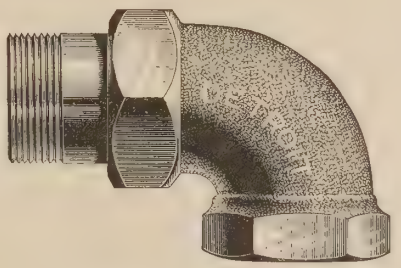
Specify these Valves and Ells in your Hot Water Heating Contracts



THE DETROIT
QUICK OPENING VALVE

FOR **HOT WATER RADIATORS** is the best. Opens full area with quarter turn, giving free circulation of water.
Readily adjusts itself to varying temperature.
Will not give trouble and annoyance by sticking. No strain on disc.

OUR UNION ELBOWS



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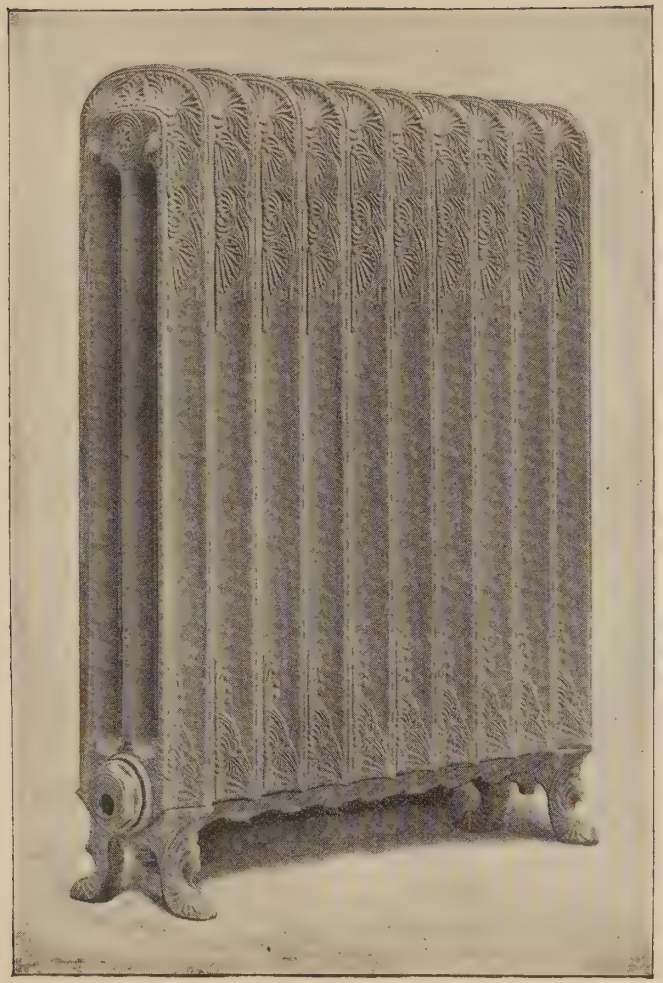

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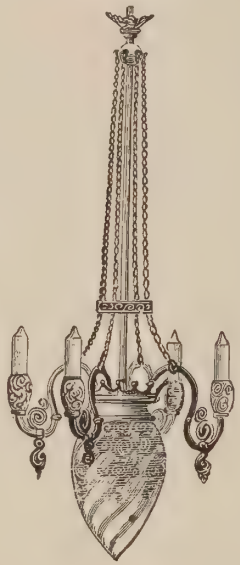

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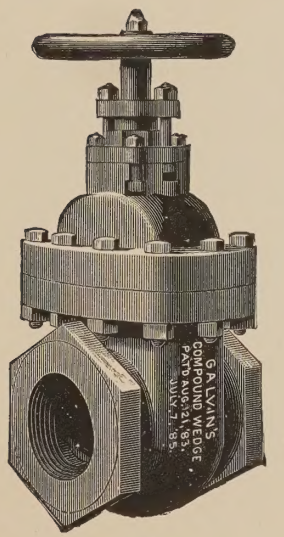

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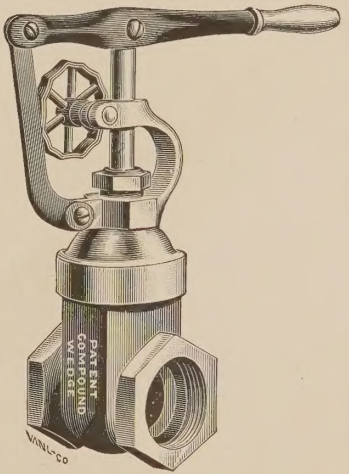

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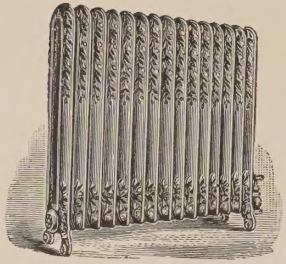

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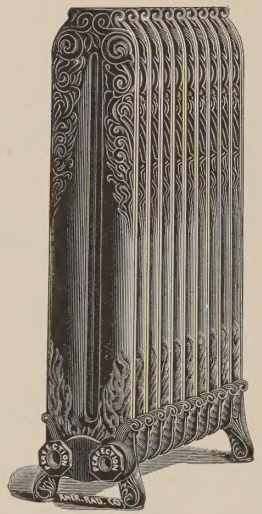

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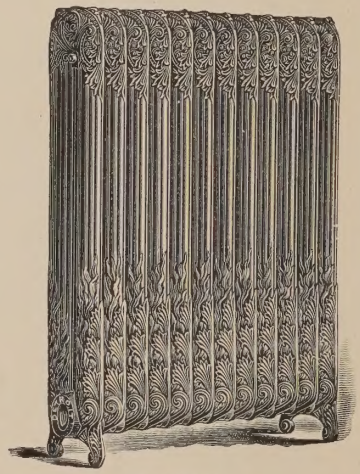

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